FDI Determinants and the effect of FDI on Economic Growth of the East African Community (EAC)

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March 2020

A Thesis submitted in fulfilment of the requirements for the Degree of

Doctor of Philosophy (PhD) Economics of the University of Westminster

Declaration

I certify that the thesis I have presented for examination for the PhD degree of the University of Westminster is solely my own work, except where explicit reference is made to the contribution of others.

I declare that the thesis is my own work and has not been submitted for any other degree at the University of Westminster or any other institutions for the award a degree.

I declare that this thesis consists of approximately 76,909 words. This excludes declaration, acknowledgement, content page and references.

Name Sam Opio
Signature _____opiosam_____

Acknowledgements

I wish to express my gratitude to people that accompanied me through this journey. I cannot find enough words to thank my advisor, Dr Olasunkanmi Sholarin, Dr Issam Malki, and Prof David Shepherd. Each of them has shown me the beauty of the research process in their own ways. I therefore, owe a huge intellectual debt to my supervisors. They were also there to listen, question and help me find my own path, through the phase when my research project was nothing more than ideas and curiosity, to a phase where it became a tangible academic output.

I am forever grateful to Dr Issam Malki for being a good supervisor (i.e., Dissertation supervisor) while I was studying for M S c International Economic Policy and Analysis degree in the Department of Economics and Quantitative Methods at the University of Westminster. I was motivated to progress from my MSc degree to PhD Economics program.

Equally, I would like to extend my sincere gratitude to Annual Progress Review assessor's (APR) team. They provided invaluable feedback in a timely fashion. These are, Dr Rebeca Munoz- Torres (APR 1 and 3) and Dr Giorgio Di Pietro (Viva examiner) and the Chair Dr Lorna Stevens. In this context, I want to say my research activities would not have been possible without your positive feedbacks on my coursework.

Moreover, as words will almost never do justice to the gratitude I feel. This thesis could not have been possible without tremendous work from the Doctoral Coordinator team report (Professor Franz Buscha, Dr. Norman Peng, Dr. Kristina Vasileva); Graduate School team (Professor Leigh Wilson, Dr. Anthony Mcnicholasstina) and Graduate School Manager, Richard McCormack. They guaranteed smooth process of my academic progression over the years. Additionally, I would like to take this opportunity to thank Professor Franz Buscha and Dr. Kristina Vasileva for approving and awarding me Globally Engaged Research Doctoral Scholarship.

I am also indebted to Dr Vincent Rich, Head of School, Organization, Economy and Society for approving my teaching hours. Without your approval, I would not have studied University Certificate of Special Study (U Cert SS) in Supporting Learning under the direction of Course Leader, Professor Terry Lamb. The successful completion of the course enables me to become Associate Fellow Higher Education UK (AFHE).

I would like to thank my friends outside and within University of Westminster, who were always generous with their time and energy to discuss, read drafts and networks. I am especially

grateful to my friends and office mates in the garden room. Particularly Carolie Guedes, Sabine Franklin, Chahna Gonsalves, Kate and Olimpia Burchiellaro for being a source of strength throughout my journey. They offered practical assistance and as well as emotional support in time of need. Am truly indebted for their generosity.

Outside the University of Westminster am grateful to Ario Bernard, a childhood friend who has been there for me in time of need, and attended all my previous graduation ceremonies. Furthermore, my sincere thanks go to Dr Patrice Kandolo Kabeya at Leeds Beckett University invauable advice during my sstudy period.

Finally, my deepest love and gratitude goes to the family. My parent Mrs Adong Norah Otok, the late Mzee Otok David, and Ms Atala Florence. Also, I extend my sincere appreciation to my brother Mr Ola Peter. Moreover, the family appreciation would be incomplete without acknowledging the good deeds shown to me by my immediate relatives such as uncles, unties, cousin sisters and brother. I guess my love for education found its root in my mother Adong Norah Otok, late Mzee Otok David and late Atala Florence. They are the source of my strength and inspiration. In times of challenges, I look up to them for hope and faith – as am always reminded that success does not come easily, and that hard work is needed for an equivalent amount of reward!

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Abstract

This thesis comprises of three self-contained analytical chapters. We attempt to answer three key research questions on the determinants of foreign direct investment (FDI), FDI-growth nexus and income convergence in the East African Community (EAC) region.

Below are our three key research questions:

1. What are the determinants of FDI to the EAC region?
2. Does FDI contribute to the aggregate economic performance of the EAC region and what is the effect of FDI on the ratio tradeable output to non-tradeable output? Also, what is the contribution of ratio tradeable output to non-tradeable output on the economic growth of the EAC region?
3. Did the EAC region experience income and FDI convergence during the study period?

We are motivated to understand the key driver of FDI to the EAC region. These member countries have continued to witness an increase in the FDI activities from 1970 to 2017. Therefore, we want to investigate if the EAC member countries received market, efficiency or resource-seek FDI (Breham, 1972). Understanding these FDI types enable policy makers to attract the right FDI type that plays significant positive role on the host EAC region. Most study suggests that market seeking FDI has greater productivity spilover to local firms than resource or efficiency-seeking FDI (Borenzstein, et al. 1998). Also, data from Bank of Uganda and Bank of Rwanda shows that most FDI goes to service sector followed by manufacturing and with fewer foreign direct investment channelled to agricultural sector. The disparity of sectoral FDI to service, manufacturing and agricultural sector motivated us to empirically assess the sectoral role of FDI, and in addition to studying the contribution of different sectoral output on the economic growth of the EAC region.

To achieve our research objectives, we applied location theory to gain better understanding of different motives of FDI (i.e., market–seeking, resource–seeking, and efficiency–seeking FDI) to the EAC. Location theory is favoured because of it is easy to apply in context to our study, and more flexible to accommodate different variable of interests. In terms of the economic growth, our analytical framework is based on Solow (1956) growth model. The model allows us to empiricall capture the role of FDI on economic performance of the EAC region, in addition to assessing the income and FDI convergence in the region.

Our research objectives are based on lack of studies on the FDI determinants, FDI-growth

nexus and income and FDI convergence in the EAC region. Therefore, our thesis seeks to fill the gap in the current literatures in the field of economic development. The data used in our study of the FDI determinants, FDI – growth nexus, and income convergence was mainly sourced from the World Bank database. These datasets range from 1970 – 2017. In addition, the bilateral FDI data from the year 2000 – 2017 that shows FDI from the UK to the rest of the EAC region (i.e., Uganda, Kenya, Tanzania, and Rwanda) were sourced from the UNCTAD database.

The report from our empirical investigation on the FDI determinants to the EAC region shows that the region received market, efficiency, and resource seeking FDI in the long-run vis-à-vis short-run period. And that resource and efficiency–seeking FDI are only attracted to the region in the face of trade liberalization. In terms of growth impact, empirical evidence indicates that FDI insignificantly contributes to economic growth at both aggregate and sectoral level. Furthermore, the study reveals that service sector output (the non-tradeable output) significantly supports economic growth of the EAC region from 1970 –2017 vis-à-vis the tradeable output (manufacture and agricultural sector output). We argue that this could be due to large amount of FDI flows to the non-tradable sector compared to the tradeable sector.

Finally, considering convergence, our study shows that from 1970 – 2017, FDI insignificantly supported beta convergence process in the region. Also, bilateral FDI data from the UK to the rest of the EAC region indicate that, from 2000 – 2017, bilateral FDI significantly contributed to beta and sigma convergence in the long-run. Conversely, we found insignificant short-run effect of bilateral FDI on beta and sigma convergence. Unsparingly, when language similarity is accounted for in our study, the result shows that income levels between the EAC region and the UK significantly reduces. We argue that language similarity promote trade and investment, in addition to facilitating technology transfer between the UK and the EAC region during the study period. Furthermore, there was evidence of stochastic FDI convergence in the region from 2000 – 2017.

We concluded our study by offering policy recommendations guided by our empirical evidence, coupled with the review of relevant empirical and theoretical literatures.

Chapter One

1.1 Introduction

This thesis attempts to explain answers to three questions about FDI determinants, FDI- growth nexus and income convergence. The explanation of answers is based on the case study of the East African Community (EAC). Before we go on, we like to make a quite note of the history of the EAC, which comprises of six countries of Uganda, Kenya, Tanzania, Rwanda, South Sudan and Burundi. These countries joined the EAC at different times, besides the founding three member states of Uganda, Kenya, and Tanzania. The formation of the EAC started with the treaty signed by Uganda, Kenya and Tanzanian governments on 30th November 1999 but came into force on 7th July 2000 after ratification by the three nations. Burundi and Rwanda became full members of the EAC 1st July 2007 and subsequently the Republic of South Sudan was admitted as a full member of the EAC on 5th September 2016. However, we have excluded South Sudan in this study due to lack of data.

The primary goal for the formation of the EAC was to address the income poverty and encourage free movement of people, goods and capital. Further, it was to guarantee political stability in addition to attracting more multinational corporations (MNCs) in form of foreign direct investments (FDI).

The information from the EAC website shows that the four pillars adopted and implemented by the EAC partner states to achieve regional integration are.

1. Customs Union is a pillar that aims at promoting free movement of goods and services amongst the EAC member states.
2. Common Market is another pillar of the EAC mandated to ensure among others free movement of people, labour and workers, capital, goods and service, and right of residence.
3. Monetary Union is a pillar with sole purpose of achieving a single currency and establishing East African Central Bank.
4. Political Federation is initiated to strengthen and promote the shared foreign policy and good governance within the EAC region.

Also, based on the EAC website, we note that the EAC region still faces a variety of challenges ranging from;

- Poor Governance.
- Inadequate legal and regulatory framework.
- Insecurity.
- Inadequate access to productive resources.
- Inadequate participation of local communities.
- Inadequate physical infrastructure and utilities.
- Weak institutional framework.
- Low public expenditure.

When we consider income level for the individual EAC member states, measured in GDP per capita US $ current price. In the year 1970, World Bank, World Development Indicator (2019) database suggest, the Uganda, Kenya and Tanzania per capita income was US $ 133.98, US $ 141.88 and US $ 209.80 respectively. The Burundi and Rwanda recorded US $69.77 and 58.53 respectively. We observe modest improvement in the per capita income level for the EAC member states. For instance, for the year 2017, Uganda, Kenya and Tanzania per capita income stood at US $ 631.52, US $ 1568.20, and US $ 1004.84 respectively. Moreover, Burundi and Rwanda reported US $ 293.01 and US $ 762.50 respectively.

However, when we consider annual average per capita income from 1970 to 2017, we found that Uganda, Kenya and Tanzania income level was US $ 326.82, US $ 541.034 and US $ 400.86 respectively and Rwanda and Burundi US $ 329.06 and US $ US $ 185.85 respectively. We can see that the per capita income level for the EAC region is modest and that there is evidence of income convergence.

Further, data from World Bank, World Development Indicator (2019) suggest that from 1970 to 2017, the population of the EAC region on average grew by 76%. Therefore, with total population of 172.95 million for the year 2017, there is strong motivation for the EAC region to attract more FDI in order to great employment and improves income level.

For instance, from 1970 to 2017, the EAC annual average FDI, net inflows (% of GDP) were at 4.13%. Moreover, when we considered the period when these EAC member countries, witnessed stable political and economic stability, in the year 1990, the EAC average FDI, net inflows (% of GDP) was 0.187% compared to 1.795% for the year 2017. We noticed modest improvement in the FDI inflows to the region. However, the amount of FDI to the EAC region is considered small enough to have any significant effect on the economic growth.

Therefore, given the above statistics and Behram (1972) FDI typology, we want to explore determinants of FDI to the EAC region and its relation with economic growth. Also, considering the availability of the EAC market size (proxy GDP current US$ 170.89 billion), population size and natural resources avaialabilitiy, we suspect that the EAC region might attract different types of Multinational Corporations (MNCs) in the form of FDI to take advantage of the available resource.

The analysis of FDI determinants, FDI-growth nexus and income convergence models in this thesis are not for an individual East African Community member states, rather we have pooled them together as a cluster. This is because the goal is to examine the overall FDI determining factors in the EAC region and the effect of FDI on the economic performance of the EAC region. The focus is on the region rather than on individual nation state in the EAC. The analysis presented in this thesis rely mainly on data sourced from the World Bank database, and UNCTAD database, hence there is little or no difference in the definition of metrics and the variables for the five EAC member states. There is an anticipated limited heterogeneity across the five countries, and this is because they are within the same trading block. There is a growing economic and political integration, and these member countries share similar social cultural values.

The similarities amongst the EAC member states informed our preference to explore the overall factors responsible for FDI inflows to the EAC region, and the effect of FDI inflows on the economic growth of the EAC region. Further, the FDI and income convergence in the EAC region was also analysed. For instance, as region, one of the most crucial roles for the EAC is to achieve prosperity, a prosperity that is underscored by competitiveness, and political and economic stability. This is consistent with the long-term goal of creating a political federation that will expand, consolidate and reinforce political, economic, cultural and social integration. Therefore, the EAC policies and programmes are aimed at widening and deepening co-operation among member States in economic, political, and cultural aspects of the society. The idea of the EAC member countries to deepen corporation was meant to improve trade relation and political stability in the region.

The goal of the EAC and the varied dimension of FDI are embodies by Multinational Corporations (MNCs) that are the main drivers of FDI. MNCs in form of FDI has experienced a steady growth over the past decades and this is because of their role as a significant component of the international capital transfer to Africa (Suleiman et al., 2013). Also, the data from the World Bank and the United Nations Conference on Trade and Development (UNCTAD)

database and Sane (2016) shows a steady rise in the global activities of the FDI. The increased activity of MNCs has led to renewed interest within policymakers in the developing economies to understand the determinants of FDI and role of FDI on the host economies. As early as 1997, Barrell and Pain reported that acquisition of the firm specific-knowledge-based-assets played an essential role in the growth of FDI and that such investments were responsible for technological diffusions and ideas across the world. Therefore, FDI is widely recognised as catalyst for economic development (Jindra & Rojec,
2014; OECD, 2005).

The developing countries are incentives to offer MNCs among others tax relieves, access to resources on the basis that FDI plays a critical role in the economic development of the developing countries like the EAC member countries. For instance, it's widely believed that the presence of FDI would promote economic growth of developing countries through knowledge transfers from foreign firms to local investors. That the transfer of knowledge can be involuntarily or voluntary happens within (inter) industry or across (intra) industries either happens intentionally (Giroud, 2012). Therefore, the presence of FDI in the service, agricultural or manufacturing industries are assumed to increase productivity of local firms (Blomström & Kokko, 2001; Caves, 1974; Hallin & Holmstrom-Lind, 2012; Javorcik, 2004; Markusen & Venables, 1999).

However, the empirical evidence on the positive productivity spill over from FDI to local firms is mixed[1]. According to Barrell and Pain, FDI provides needed investments capital and enhance the productivity of local firms hence supporting economic growth. For instance, Barrell and Pain found that a 1% increase FDI activity in German and the UK results in a significant effect on the improvement of technological progress of the manufacturing sector (i.e. private sector) by 0.27% and 0.26% respectively. By contrast, there seems to be a nugatory effect on the non-manufacturing sector. Most empirical evidence shows that FDI
benefits developed countries; especially export-oriented economies like German (Barrell and Pain, 1997) compared to African economies. There are two plausible explanations to account for the differential economic effect of FDI in developed countries and those of African economies, mainly the Sub-Saharan African (SSA) economies. First, developed economies such as German, the UK possessed sound absorptive capacities. These absorptive capacities relate to well-developed infrastructures (transport, energy and communication infrastructure). Also, developed countries do have well-developed human capital, reliable institutional

[1] See empirical studies by Iršová & Havránek (2013) and Görg & Greenaway (2004) found presence of positive backward spillover, insignificant negative for horizontal and forward spillovers and positive.

quality such as the rule of law. Secondly, developed economies disproportionally receive a high volume of FDI.

Considering recent UNCTAD data for the year 2017, showing the global distribution of FDI flows in US $ at the current price. It suggests that the developed economies accounted for US$ 712.38bn compared to a mere US$ 67.07bn for the developing countries. In the same year, the EAC region only received US$ 2.92bn, an increase of 6.57% from the previous year. Apart from disparity of FDI seen among world economies, in terms of sectoral distribution, we observed that FDI in services now accounts for almost 65 per cent of the total worldwide inward FDI stock (UNCTAD, 2014). Further, recent UNCTAD World Development Report 2018 indicates that in the year 2017, announced Greenfield FDI projects, in millions of US$ to Africa are unevenly distributed among different sectors of the economy. The report shows that the services sector accounted for 53,671 projects. While total announced Greenfield FDI to primary and manufacturing sector were registered at 10,574 and 21, 060 respectively.

In the EAC we observe similar sectoral FDI distribution. For example, Bank of Uganda, Private Sector Investment Survey Report (2017) shows that in 2016, the FDI stock in the agricultural sector was only US$ 6.67million while manufacturing sector received US$ 321.88 million. According to the report the service sector accounted for the most extensive share of FDI stock in Uganda, with finance and insurance sub-sector accounting the largest, with FDI stock of US$ 357.04 million. Further, similar sectoral FDI distribution in Rwanda was cited in the National Bank of Rwanda, Rwanda Development-Foreign Private Capital Report 2017.

Eschenbach and Hoekman, (2005) and Francois, (1990) posit that host economies should continue with policy of attracting service FDI. Eschenbach and Hoekman, (2005) and Francois, (1990) argues that the growth of services is critical for economic performance and the development of other sectors such as manufacturing and agricultural sector.

However, Borenzstein et al. (1998) observe that for countries to benefit from the foreign direct investment, the host countries must posit well developed infrastructures such as good roads and human capital. Moreover, Borenzstein et al. argues that this would permit knowledge and technology transfer from the foreign firms to domestic firms. Based on Borenzstein et al. argument, the EAC region should register limited benefit from the FDI inflows to the region, as the region has low absorptive capacity. Furthermore, coupled with limited FDI flows to the EAC region as presented above, the effect of FDI on economic performance of the EAC region becomes uncertain.

Theoretically, Bwalya (2006) and Blomstrom and Kokko (1998) forward three main channels through which productivity spillovers from the FDI to local firms might occur. Blomstrom and Kokko (1995) pointed out that the three channels presented below provides an opportunity for the host country's government policy makers to design and implement policies which increases technology transfer from foreign to local firms.

The first channel happens through the movement of skilled personnel from the foreign firms (MNCs) to the local firms. Bwalya (2006) and Blomstrom and Kokko (1998) argues that highly skilled employees formerly working for the MNCs firms usually bring with them advanced production and distribution knowledge which are often utilised by domestic firms. The second channel through which local firms acquire advanced foreign technology is through demonstration channel. Bwalya (2006) and Blomstrom and Kokko (1998) stated that demonstration effect from foreign firms to local firms improves productivity of the local firms as local firms learn new production techniques. Finally, a third channel consists of competition effect. Bwalya (2006) and Blomstrom and Kokko (1998) discussed that competition between foreign firms and local firms pushes the local firms to up-date the production techniques, resulting into efficient production of goods and services by local firms. However, Aitken and Harrison (1999) indicate that positive effect arising from competition effect might not be realising if the foreign firms acquires substantial local firms' market share. However, discussion on the technology and knowledge spillovers from foreign
firms to local firms in different sectors of the economy is beyond the scope of our thesis[2].

The current debate on the FDI determinants to SSA countries suggests that market size and natural resources play a critical role in attracting FDI to SSA countries. However, the determinants of FDI to developed and emerging economies are not necessarily the same as those of SSA economies. For instance, one of the motivations for the FDI in the developed
economies is a strategic asset –seeking FDI, in the form of merger and acquisitions (M&A). The asset–seeking FDI is uncommon in SSA countries.

[2] See empirical studies which found insignificant positive effect of FDI horizontal spill overs on productivity of local firms in Committee of European Economic Co-operation (CEECs) or even negative effect (Damijan et al., 2013; Kolasa, 2008: Gersl, Rubene, & Zumer, 2008; Konings, 2001; Djankov and Hoekman, 2000). Further, consider these literatures that suggest employees' mobility might be a source of knowledge spillovers as the foreign firms provide host country workforce with more, education, training and valuable work experience (Markusen & Trofimenko, 2009; Smeets, 2008; Glass & Saggi, 2002; Fosfuri, Motta, & Ronde, 2001).

According to Hanemann and Huotari (2016), Chinese investment to the European Union is evenly spread. Moreover, Chinese investment in German is technology driven. Thereby, indicating that European countries attract strategic assets seeking FDI from China – such type of FDI is not attracted to the EAC region due to lack of advance technology asset.

Most empirical evidence indicates that FDI to the SSA economies are market–seeking type (Asiedu, 2006; Yasin, 2005) and resource–seeking type (Olatunji and Shahid, 2015; Vinesh et al., 2014; Onyeiwu and Shrestha, 2004). The study on the efficiency-seeking FDI type is very scant in the SSA region. In our study, we applied location theory to better understand different motives of FDI (i.e., market–seeking, resource–seeking, and efficiency–seeking FDI) to the EAC region. In terms of the economic growth, growth theories such as exogenous (i.e., Solow (1956) growth model) and endogenous growth model were developed to explain economic growth in the developed countries.

In the context of developing economies, the analytical framework did not explicitly account for characteristics most associated with developing countries. These characteristics are poor infrastructure and low level of human capital. For instance, Solow seems to assume that developing countries with low capital-labour ratio will witness economic growth. That small injection of investment capital would translate into massive economic growth of developing countries. Solow suggests that marginal productivity of capital is higher in developing countries with low capital-labour ratio. However, this might not be the case as developing countries possessed low absorptive capacity (i.e., low human development and infrastructures) that hinders economic growth.

However, existing empirical literature overwhelming supports the notion that Foreign Direct Investment (FDI) improves the economic performance of the developing country (Sothan, 2017; Shah and Sirai, 2015; Mileva, 2008; Mody and Murshid, 2005). We posit that this could be because FDI provides needed investment capital, which is lacking in developing countries. Moreover, they argue that FDI does open developing countries to lucrative external market through increase export hence improving the countries' foreign reserves currencies. However, in the context of Sub-Saharan African (SSA) economies, the contribution of FDI to the host economies is mixed. For instance, studies suggest that FDI to SSA economies improved economic performance (Munyanyi, 2017; Chiwira and Kambeu, 2016; Jilenga et al. 2016). Conversely, Klobodu and Adams (2014) and Ookoyo (2011) found that FDI impedes on the economic progress of African countries.

Moreover, we found limited studies on FDI-growth nexus for the regional economic communities (RECs) of the African countries. Furthermore, limited existing studies have concentrated on the wealthier regional trading block. For instance, some studies have investigated the effect of FDI on the economic growth of the Economic Corporation for the West African States (ECOWAS) (Anyanwu and Yameogo, 2015; Ajide and Raheem, 2016). Besides, Vinesh et al. (2014) studied the effect on FDI on the economic growth of the South African Development Committee (SADC). In our empirical analysis, we did not find any empirically studies on the FDI-growth nexus in the context of the East Africa Community (EAC) region. Considering the controversy and lack of study on the FDI-growth nexus in the EAC region mentioned above, this thesis attempts to fill the gap by empirically investigating the effect of FDI on the economic growth of East Africa Community (EAC) region from
1970 to 2017. We believe, by considering a more extended study period (i.e. 1970 to 2017) it enables us to better capture the influence of FDI on the economic performance of the EAC region.

Furthermore, we found that studies looked at the overall contribution of FDI on the SSA economies (Klobodu and Adams, 2016; Sakyi et al., 2015; 2015, Ezeji et al., 2015; Antwi et al., 2013). The weakness of such studies lies in its general policy recommendations. Such studies might assume all sectors of the economy exert uniform pressure on economic growth. According to Alfero (2003), countries that attract more FDI to manufacturing benefits as the contribution of the manufacturing sector on economic growth are relatively higher than those of agriculture and service sector. Therefore, our study goes beyond just studying the FDI- growth nexus at aggregate level. We looked at the contribution of FDI on the different sector of the economy. Moreover, we also continued to examine which sectors of the economy significantly contribute to the economic growth of the EAC region.

Moreover, some studies assessed the contribution of FDI to different sector on the economy. For instance, there are overwhelming supports that FDI promote manufacturing output (Adegboye et al. 2016; Oloyede, 2014; Oluchukwu et al. 2013). However, Okoli and Agu (2015) and Orji et al. (2015) both found that FDI did not improve the productivity of the manufacturing sector in Nigeria. Also, there empirical studies that found manufacturing sector have positive influence the overall economic performance of the developing countries
(Addo, 2017; Tsoku et al., 2017; Alfero, 2003). Besides, studies that looked at the contribution of FDI on agricultural sector report mixed results. However, there is a consensus that FDI to the agricultural sector hinders the performance of the agricultural sector (Epaphra and Mwakalasya, 2017; Akande and Biam, 2013). However, Ogbanje et al. (2010) found that FDI promoted the agricultural output of the Nigerian economy from 1970 to 2007. According to Adesoye et al.

(2018), the agricultural sector was responsible for the economic growth of Nigeria economy from 1981 to 2015.

Furthermore, the study by Lartey (2016) and Posu et al. (2010) indicate that FDI improves the productivity of the service sector, hence supporting our empirical findings that FDI in EAC region benefited service (non-tradeable output). In addition, Tregenna (2008) noted that the expansion of the service sector in South Africa led to increased employment and with an overall positive effect on economic growth. According to Solow (1956) growth theory, the assumption is that developing countries with a low level of capital stock will inevitably catch- up with developed countries moreover, that this occurs when developing countries attract more investment capital hence improving hots countries' capital-labour ratio. Unfortunately, we did not find any study that looked at income and FDI convergence in the EAC region.

Our study attempts to contribute to scholarship three themes of FDI determinants, economic growth and income and FDI convergence. Our case study of East African Community (EAC) was adopted for the following reasons:

- There is limited literature on FDI and the EAC region from 1970 – 2017 (i.e. resource-seeking, market-seeking or efficiency-seeking FDI types).
- The EAC is relevant to the East African Federation, which seeks to foster integrated economic ties to attract more foreign investment in addition to speeding up the movement of capital and people within the region and promoting regional growth and political stability.
- Lack of investment capital and financial exclusion warrant a study, this is because an increase in FDI inflows to the region will improve economic growth and subsequently improving the welfare of the citizenry.
- We want to provide policy specific recommendations to the EAC region, based on research findings.

In context of our research motivation, our thesis contributes to knowledge by filling the research gap identified in the existing literature. Our empirical contribution is shown in chapter 2 (FDI determinants), Chapter 3 (growth chapter) and Chapter 4 (income and FDI convergence). Below is our four research contribution.

1. The study is the first to explore the different factors responsible for the FDI inflows to the EAC region both in the short-run and long-run period. Moreover, the study period covers a more extended period to enable us to better capture the determinants of FDI inflows to the EAC region from 1970 – 2017.

2. Our empirical study investigates the effect of FDI on the economic performance of the EAC region. The study looked at the influence of FDI on the aggregate economic performance of the EAC region. Also, we further examine the contribution of FDI to the different sector of the economy. Besides, we provide empirical evidence on the contribution of different sectors of the economy on the economic growth of the EAC region. In other words, this is the first study to assists us in understanding whether different sectors of the economy exert pressure on economic growth differently in the EAC region.

3. Moreover, the originality of our study lies on the fact that it is the first study to explore the income and FDI convergence in the EAC region. Furthermore, we examines whether bilateral FDI from the UK speeds up income convergence between the UK and the EAC region.

4. Finally, our study adds to the existing empirical literature on the FDI determinants, economic growth and income and FDI convergence, by opening a new frontier of regional studies upon which future studies can build on. In addition, we provid policy specific recommendations informed by our empirical findings.

1.2 The research aim

In context of our research motivations, the central aim of our research is to understand the determinants of FDI to the EAC region. Furthermore, we also seek to find out the contribution of FDI on the economic performance of the EAC region. Our thesis involves studying FDI effect on the economic growth at both the aggregate and micro level. Finally, we want to explore whether the EAC region witnessed income and FDI convergence process. We achieved our research aim through three research questions seen below.

1.3 The research questions

1. What are the determinants of FDI to the EAC region?

2. Does FDI contribute to the overall economic performance of the EAC region and what is the role of FDI on the ratio tradeable output to non-tradeable output? Also, what is the contribution of ratio tradeable output to non-tradeable output on the economic growth of the EAC region?

3. Did the EAC region experience income and FDI convergence during the study period?

1.4 The research objectives

To achieve an answer to the three research questions above, we presented the following three research objectives.

1. To investigate the determinants of FDI to the EAC region
2. To examine the contribution of FDI to the overall economic performance of the EAC region as well as the role of FDI on the ratio tradeable output to non-tradeable output. Also, to examined the effect of the ratio tradeable output to non-tradeable output on the economic growth of the EAC region.
3. To find out if the EAC region experience income and FDI convergence during the study period.

The remaining of the thesis is organised as follows:

Chapter 2 Determinants of FDI

Chapter 3 The effect of FDI on economic growth (aggregate and micro level) and influence of sectoral output on economic growth in the EAC region

Chapter 4 FDI and income convergence

Chapter 5 General conclusion and policy recommendations

Chapter Two

2.1 Introduction to the Determinants of FDI

The discussion in this chapter of the thesis is based on the analysis of the determinants of Foreign Direct Investment (FDI) in developing countries, especially countries from the continent of Africa but more specifically on the East African Community (EAC). The discussion is structured in relation to time series and panel data studies, which focuses on the case study of countries within the EAC. At a first glance, the aim is to identify studies that have been conducted on the EAC nation states individually or as a community, which addresses issues of the determinants of FDI in the short run and long run periods.

The discussion starts with a brief analysis of FDI theories, in relation to the EAC specifically and more generally on the African continent but also from the context of developing economies. There are five FDI theories explored, which include location theory, internalisation theory of FDI, theory of international production, Alber (1970) FDI theory, and the Bhagwati (1978) theory. Our analysis of the determinant of FDI to the regional EAC, region located in the continent of Africa is based on our assessment of these theories against backdrop of the case study of the EAC but also the insight derived from empirical data.

In this thesis, the term long run period refers to a period where all factors of production and costs (associated costs) are variables. In other words, a period where a firm can adjust all costs. Conversely, in the short run period, some factors of production are fixed, and firms can only influence market price via adjustment made to production output (chamberlin and yueh 2006).

The results of our analysis indicate that unlike market size, there is zero short-run effect of natural resources, and labour availability on the FDI (i.e., FDI netinflows as % of GDP) to the EAC region from 1970 to 2017. To the contrary, in the long run period, market size, labour avaibaility and natural resource had significant effect on FDI during the study period**.** The study also indicates that in the long-run only market size attracts market –Seeking FDI to the EAC region. This leads to the argument that the FDI inflows to the EAC nation states are mainly market-seeking FDI. This position is substantiated by the evidence from the analysis of data. For instance, our empirical evidence shows that the EAC region attracted market-seeking FDI both in the short-run and long-run period but significant effect on the FDI inflows to the EAC region was only observed in the long-run on the market size. However, the presence of trade liberalization apparatus in the region makes the market size variables to be negatively associated with FDI inflows to the EAC region from 1970 to 2017. This means that in a nation state within the EAC where there have been limited markets size and high degree of trade liberalization –these countries received limited market-

seeking FDI type. Furthermore, we also understood that the natural resource variable only seems to attract resource - seeking FDI only when the EAC as a region is open to trade, but also having the human capital to operationalise trade. Therefore, in the presence of human capital and trade liberalization, the EAC region attracts resource –resource seeking FDI both in short-run and long-run period. However, based on the magnitude of the estimated coefficients, we report that human capital plays a more significant role in attracting natural resource–seeking FDI. In terms of efficiency-seeking FDI proxy by labour availability, in itself discourages, the efficiency-seeking FDI both in short and long-run period. This leads us to a conclusion that labour availability negatively affects the efficiency-seeking FDI to the EAC region and this negative effect of labour availability on the efficiency-seeking FDI exists both in the short-run and long-run period. However, we found that in the presence of trade liberalization, there is a positive association between labour availability and FDI inflows to the EAC region. This gives a strong indication that in the presence of trade liberalization, labour availability in the EAC region has positively encouraged efficiency-seeking FDI to the EAC region during the period under study 1970 -2017.

Therefore, as pointed above, our discussion starts with a analysis of FDI theories as seen below.

2.1.1 Location Theory

The industrial location theory was developed by Weber (1909) and it has been instrumental in the understanding of why Multinational National Corporations (MNCs) in form of FDI exist. It posits that firms invest abroad in order to reduce production cost, which in turn enable them maximise revenue and this means that the location theory have the capacity to help up provide answers to questions pertaining why and where MNC in form of FDI invest in the EAC region. However, why and where MNC invest are guided by a country or region's location factors such as the presence of cheap labour, natural resources, market size and technology availability. However, in the context of the East African Community (EAC) block, the location factors we assumed to have influence on decision making process for foreign investors while considering to investment in the region are availability of raw materials, market size, and labour-force.

Therefore, the EAC block attract FDI based on her location factors but the investments are of different types. This is because; according to Behrman (1972) the FDI typology consists of resource, market, efficiency and strategic asset seeking FDI. However, it has been observed that eclectic paradigm share similarity with Location theory (Dunning, 1977). For instance, Dunning's localization advantages assume that firms invest abroad to take advantage of cheap labour costs, saving transportation costs, natural resources, jumping trade barrier and servicing domestic market. Based on location theory, we assume that the EAC region might attract resource, market

and efficiency seeking FDI. This is because the region composed of unindustrialised countries. For example, study by Drogendijk and Blomkvist (2013) found that market size and natural resources attracted Chinese investment to Uganda.

Another point was raised by Santiago (1987) where it has been argued that MNCs would invest directly to the host countries based on supply – demand factors (input-output-factors). Santiago refers supply factors to be associated with abundant raw materials like crude oil, minerals and cheap labour (input factors). It was noted that these factors are imperative in reducing production costs of goods and services for MNCs due to economies of scale. On the other hand, it was reported that demand side factors are composed of variables such as openness to trade, population size and per capita income (i.e. demanding products produced by foreign investors). Therefore, review of location theory suggests various factors might attract different FDI types. For instance, supply side factors normally tend to attract resource seeking FDI, and efficiency seeking (as well as export-oriented FDI). The demand side factors might attract market-seeking FDI type.

However, we note that the weakness of the location theory lies in its simplicity and this is because the location theory seems too general to be empirically tested. Conversely, the strength of the theory lies in its flexibility to accommodate different variables in the study, which makes its adaptable for the investigation of different motives of MNCs in form of FDI to the EAC region.

2.1.2 Internalization Theory of FDI

Internalization theory of FDI attempt to explain why firms internalize their production other than transacting through the market. According to the theory, a firm seems to internalize their production process due to presence of asymmetric information that might occur during process of market transaction. For instance, foreign firms might fine it risky to enter into contractual agreement with local firms to produce some part of their products. Ulternatively, local firms might not have technological capacity to produce needed items or they could charge higher price to make needed items. In this scenario, foreign firms would prefer to internalise their production process rather than transacting it through the market due to imperfection in an intermediate market such as technology and human capital.

Therefore, internalisation hypothesis assumes that MNCs internalise their production of goods and services in foreign countries by setting production facilities directly in the host's country. However, there are costs and benefits associated with internalising production process by MNCs through FDI. For example, foreign firms internalizing their production ratherthan transacting through the market, as noted by Coase (1937), the foreign firms can avoid costs associated to delays in delivery and administrative or enforcement costs. The benefit associated

with internalisation rather than licencing some stages of production to local firms relates to averting price discrimination that, may take the form of higher prices charged on inputs for foreign investors vis-à-vis local investors. In other word, problem of information asymmetry might exist in the market transaction.

In this context, there are costs and benefits associated with MNCs internalising their production processes and so, decision to either internalize or conduct market transaction is determined by magnitudes associated by either costs or benefit. Example, if costs are greater than benefits, the MNCs does internalize their production rather than participate in market transaction and vice versa. The theory has been tested and found to be relevant to industries having higher expenditure on research and development (Buckely and Casson, 1976). Such an industry is technology industry, where firms invest heavily on research anddevelopment.

To illustrate why firms might consider internalizing production of goods and services rather than transacting through the market, consider an American multinational company Google. Google Company specializes in the provision of internet related services such as search engine, software, and cloud computing. The company can either subcontract her work to small local technology firm in Kenya or the Google Company can design new software. However, due to market imperfection, if small firms do not deliver the contractual obligation as required, Google Company incurs costs associated to enforcing contract in Kenya's court system. This might be perceived costly for the Google company.

For instance, according to World Bank data, it takes roughly four hundred and thirty-seven (437) days to enforce contract in Kenya (i.e. time taken to resolve disputes). In addition, Kenya's quality of judicial process index is rank nine out of eighteen (with eighteen considered efficient). In this context, according to internalization FDI theory, Google company might prefer internalizing development of new software only if it is expensive to transact through market due to costs associated with enforcing contracts and weak judicial process in Kenya.

The weakness of internalization theory is that, it is empirically difficult to verify or test as it's too general (Agarwal, 1980; Rugman, 1985). Furthermore, the weakness of the theory is compounded by its inability to explain how MNCs creates market imperfection rather than simply reacting to market imperfection (Buckley, 1985).

2.1.3 Theory of International Production

The international production theory pioneered by Caves (1974) and Hymer (1960). The theory suggests that MNCs invest directly in the host country like Tanzania or region like the East African Community (EAC) region primarily to generate economic rent (i.e. profit). This FDI motive is achieved by investing locally to take advantage of local resources, in addition

to servicing the domestic market (Chen et al. 1995). However, Dunning (1977) observed that, MNCs can only undertake FDI to exploit profit potentials in the host countries or region conditioned on MNCs possessing intangible assets. According to Dunning (1977) Internalizing, Localizing and Ownership advantage (i.e. ILO) frame work, the intangible asset falls under ownership advantage. According to Dunning, MNCs possessing these intangible assets in form of technical know-how, advance managerial capabilities (i.e. ownership advantage), are able to invest in foreign countries and take advantage of profits availability. However, Kojima (1973) and Vernon (1966) observed that MNCs do compete for limited markets both at home and abroad. Therefore, one of the reason multinational firms do have their production facilities abroad is to protect their export market abroad which might be threaten by competitors either domestic competitors or international competitors (Vernon,
1966). For instance, the location choice for MNCs to invest in Africa in the form of FDI is based on those economies that offer greater return to investment (Asiedu, 2002a; Schoeman et al., 2000; Jaspersen et al., 2000).

In theory, Kojima and Vernon suggest that global American soft drinks companies, like Coca-Cola have to compete with Pepsi Company in the US home market. Moreover, Coca-Cola and Pepsi Company seem to have invested in Kenya in order to compete for foreign market. Besides, this competition is further intensified by presence of Kenya's local firm Softa (soft drink Company). However, Dunning (1977) reported that Coca-cola and Pepsi Company are able to compete favourably with Softa Company because of possession of ownership advantages. The ownership advantage which Softa local firms does not have. Kojima (1973) further single out the unfavourable labour market at home as reason why
MNCs undertake international production. For instance, wage rise or other factors that might disadvantage MNCs' export might force them to invest in foreign countries. In other word, the argument in favour of international production stems from wage rise at home. It is expected that wage rise might render MNCs products uncompetitive in the foreign market. This is because foreign products might be perceived expensive compared to locally produced goods.

Therefore, unfavourable macroeconomic conditions such as currency appreciation and wage rise provides convenient justification for MNCs to invest abroad (Kojima, 1973). In context of international production theory, we assume East Africa Community region might attract FDI only if foreign investors are able generate revenue higher than would be revenue generated from home country. Therefore, has MNCs firms enjoys ownership advantage, and faced with unfavourable macroeconomic conditions at home, they might consider investing in the EAC region to maximise profits.

2.1.4 Alber (1970) FDI Theory

Aliber (1970) FDI theory is based on the strength of currency. Also, it is known as currency area hypothesis. The theory attempts to explain global occurrence of MNCs in form of FDI, based on strength of the currency. Aliber forwarded FDI theory based on relative strength of various currencies. Therefore, the Aliber (1970) FDI theory suggests FDI happens as a result of differences in the strength of the currencies in the source and hosts countries. The theory suggests that economies with weaker currencies compared to stronger investing economies can attract FDI in order to take advantage of currency difference between source and host economies. For instance, the theory assumes that foreign investors residing in the UK would likely invest in the EAC region. This is because of weak local currency (Shillings) of the regional member countries compared to sources economy, the UK pound Stirling (currency). This allows foreign investors benefit from currancy differential between source and host economies, hence taking advantage in difference of market capitalization rate.

In the broadest sense, the theory assumes that, investors residing in countries that belong to strong currency area will invest in countries whose currencies are weak (Moosa, 2002). In other words, the theory assumes that, countries in strong currency area are incentivising to invest abroad vis-à-vis those in weak currency area. Moreover, because of the potential of lower risk structure for the MNCs, they enjoy privilege of acquiring needed investment capital from capital market at a lower interest rate (costs of capital). While host local firms
are faced with higher costs of capital from international capital market. This could be due to high perceived risk associated local firms defaulting on borrowed capital. This might explain why cheap investment capital (i.e. lower costs of capital) are awarded to foreign investors rather than domestic investors. This resonate with low risk of default on obtained loan by foreign firms, which ensure foreign firms maintain same patterns of earnings at higher rate as oppose to domestic firms.

Therefore, a combination of stronger currency and cheap access to needed invested loan might explain why MNCs residing in strong currency area invest in weak currency area. The theory provides mechanism to understand direction of FDI on the basis of relative currency strength for different countries. It gives an indication that a FDI inflow is associated with currency undervaluation and FDI out flows with currency overvaluation (currency appreciation). Theoretically, a change in countries' exchange rate has effect on FDI flows making it attractive to foreign investors whose currency has appreciated to invest in countries whose currency depreciated because they can acquire assets at a cheaper cost (Moosa, 2002). We observed that Aliber's theory might well provide an explanation for the current direction of direct investment

in developing economies. However, it might be irrelevant for least developed economies like EAC member countries. This is due to inadequate capital markets as well as deeply regulated foreign exchanges. We also found that, Aliber's theory suffers from its inability to explain investment among developed economies with equal currency. Secondly, it also fails to offer credible explanation pertaining investment of firms residing in developing countries (economies with weaker currency) that are investing in the developed countries (economies with strong currency).

2.1.5 The Bhagwati (1978) Hypothesis

In attempt to provide an account as to why MNCs undertake FDI in the host countries, Bhagwati (1978) hypothesis is grounded on host countries government trade policy such as, conducting export promotion strategy or import substitution policy. For instance, export promotion strategy entails government policies designed towards enhance domestic firm's capability to export goods to international market. Policies such as currency devaluation, tax relieve, offering financial grants and looking for them international market ensures their products are cheap and able to compete effectively. While import substitution trade policy (popular in the 1950s and 1960s) adopted by developing countries were intended to ensure domestic firm flourish by restricting specifically cheap imported good that undermined sales

of domestically produced goods. This might be achieved through high tariff on imported goods. The idea of import substitution was for developing countries to be independent and self- reliant economically. It is against these trade policies that Bhagwat hypothesis (1978) was developed. For instance, Bhagwati argue that developing countries that adopt export- promoting strategy (trade openness) were more likely to attract FDI inflows as oppose to those countries import substitution strategy. To Bhagwati defence, it is believed that government conducting export trade strategy tends to encourage export of domestically produced goods by offering incentives as noted earlier tax holiday, as well as devaluing country's real exchange rate relative to importing countries thereby marking their product cheaper. According Bhagwati it appears that such countries are open to trade, and so encourage MNCs in form of FDI to invest in the country by offering foreign investors incentives accorded to domestic firms hence stimulating economic growth and development of developing countries.

However, it can be argued that countries relying on import substitution strategy discourage FDI inflows as the country's policy leaned towards country's economic independency and self-reliance by promoting domestic firms. Such policies, from Bhagwati observations discourage FDI inflows. To achieve this, countries substitute initially imported goods through imposing tariffs and quotas on imported goods or by appreciated country's real effective exchange rate to

stimulate domestic investment which result to country's growth and development, for instance when country's effective exchange rates of imports exceed the effective exchange rate of export, import substitution strategy become successful (Balasubramanyam, Salisu & Sapsford 1996). Bhagwati hypothesis on determinants of FDI inflows are supported empirical studies on determinants of FDI, where trade openness fairly captures export promotion strategy has attracted MNCs inform of FDI to African countries, specifically export oriented FDI (Moosa and Caralak, 2006).

Although Bhagwati (1978) claimed that it is an alternative FDI theory capable of explaining observed direction of FDI. We also present discussion on Bhagwati (1978) hypothesis which is like Aliber (1970) theory and location theory. According to Aliber (1970), the host economy would attract more FDI due to weaker currency relative to investing economies. Moreover, we argue that if host economy adopts import substitution strategy. The host economy might invest in its human capital to improve her production efficiency and capability, introduce import barriers such as high tariffs or even imposing quotas on import goods to discourage imports. Furthermore, she might also increase investment in infrastructure like roads, telecommunication and energy infrastructure with a view of reducing production costs. This would improve the host economy's location advantage. Therefore, this might attract market seeking FDI, and is captured by location theory. We argue that Bhagwati (1978) might be a combination of Aliber (1970) theory and Location theory, depending on country's strategy. In other word, export promotion strategy would be associated to Aliber FDI theory while import substitution strategy is for location theory.

The advantage of Bhagwati (1978) theory is based on its useful to offer practical policy recommendations to the host economy. For example, if the objective of the study is to recommend a specific practical policy application pertaining whether to adopt import substitution strategy then market seeking FDI becomes clear option to policy makers and practitioner. If intention is for the promotion of export-promotion strategy, then policy practitioner should be encouraged to attract efficiency seeking FDI. In this case, trade liberalization becomes an essential part in costs reduction for international trade.

2.2 Summary of FDI Theories

This brief introduction to a selection of FDI theories discussed above covers location theory, internalization theory, international production theory, Aliber theory, and Bhagwati theory. The review of these FDI theories suggests that there are different ways to explain the existence of MNCs in the form of FDI but also provides a theoretical base from which we seek to investigate and analyse the case study of the EAC. When read alongside the other chapters of the

thesis, the analysis presented in this chapter adds up in fulfilling the research goal and objectives. The aim is to establish the determinants of different FDI to the EAC region of the Africa continent, and this aim is informed by the FDI theory adopted for the analysis, which are derived from the analysis of two factors, one is flexibility and the other is ease of application**.** In the discussion of these various FDI theories, we found that these FDI theories seem to complement rather than substitute each other. For instance, in the location theory and internalization theory it seems that in principle the main motive for MNCs to undertake FDI is driven by costs reduction associated with the production of goods and services. In other words, evaluation of whether MNCs will undertake FDI is guided by production costs.

Another example is the case of location theory, where MNCs would directly invest in the host country to take advantage of resources availability like natural resources, which allows for production of goods at a cheap cost. In a similar vein, the internalization theory also suggests that MNCs would invest in the hosts by internalizing it production processes, only if the costs of transacting through the market are higher than internalizing production. Further, it was observed that regardless of each of these FDI theories' weakness, they are broadly able to offer guidance into empirical examination of the of the FDI motives to EAC region. For instance, although location theory is broad, it allows us to empirically investigate FDI association with economic variables such as resource availability in the EAC region.

Moreover, Aliber (1970) cannot be adopted in this study as we were not looking at whether currency weakness attracts FDI to the EAC region. Although it could also be argued that Aliber theory is applicable as most of the FDI comes from Europeans union (EU) member countries, United States of America (USA), and to smaller extent Middle Eastern Arabs countries (See UNCTAD Statistics Website, 2019). The EU member countries and USA have stronger currencies relatives to the EAC regional member countries. Therefore, it can be argued, according to Aliber, that this is due to stronger currency, acting as mechanism for the perceived FDI from European and US countries to EAC. However, because we use total FDI, some FDI might be coming from Nigeria to Kenya (EAC member country). Nigeria is Africa's largest economy (based on gross domestic product) based on available data from the World Bank World Development Indicator data base. Therefore, Nigerian firms could potentially be investing in Kenya. However, in context of Aliber theory, FDI from Nigeria to Kenya should not occur due to Kenya's currency being stronger that of currency of the investing country Nigeria.

Therefore, based on our research aim, which seek to understand the determinants of FDI to the EAC region, location theory is favoured. The location theory unlike other discussed FDI theories is very general. The location theory also allows us to capture different types of FDI.

These different types of FDI according to Behrman (1972) FDI typology are; resources, efficiency, market and strategic assets seeking FDI.

The Bhagwati (1978) Hypothesis model cannot be estimated due to luck of data. For instance, to capture export promotion strategy, variables such as government subsidies or tax exception on exported goods are needed. For import substitution strategy, import quotas or tariff barrier variables are required as proxy. Furthermore, Alber (1970) FDI Theory is empirically difficult to estimate when we use total FDI as this might include foreign investment from countries with weaker currency relative to those of the EAC member countries. Therefore, due to luck of data from 1970 to 2017, for total FDI for countries with stronger currencies vis-à-vis the EAC region, we are unable to estimate Aliber (1970) model. In terms of Theory of International Production and Internalization Theory of FDI, these theories suggest that the centrally motive for foreign investors is cost reduction, and this captured in the location theory type such as availability of natural resource, large market size and lower production cost (cheap labour). Hence location theory is favoured and can be empirically tested as seen in this study.

The result of our study based on our summary of descriptive statistics indicate that the mean value of FDI netinflows as %of GDP from the year 1970 to 2017 stood at 2.49%. However, GDP (constant 2010 US$), where the data are in constant 2010 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates is recorded at US$8.89 billion. Moreover, resource availability proxy by total natural resources rents (% of GDP) had a mean value of of 10.32%. The total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. For human capital proxy by School enrollment, primary (% gross) had a mean value of 85.33%. The gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education show. Finally, population size reflected by population ages 15-64 (% of total population) have a mean value of 50.75%. In our thesis, the total population between the ages 15 to 64 as a percentage of the total population counts all residents regardless of legal status or citizenship (detailed discussion of descriptive statistics refer to Chapter Two – empirical equation and results section).

2.3 Review of empirical literature on FDI determinants

The review of a selection of empirical literature on FDI determinants in Africa countries forms the discussion in this section of the chapter. The primary goal is to understand existing scholarship in the context of countries from the Africa continent, while also attempting to make meaningful contribution to the growing body of knowledge. However, the review is intended for identifying gap in empirical literature, which in turn informs the development of new knowledge production in relation to the determinants of FDI. The focus of the review is on the Africa continent and where possible there is an emphasis in countries from east Africa region, especially the East African Community (EAC).

Location theory is one of the most suitable options for theories that help in understand but also identifying the determinants for FDI in the EAC. The adoption of the location theory for this study is based on the simplicity of design and flexibility in accommodating different types of FDIs. In relation to the type of FDI, it has been suggested by Behrman (1972) that there are mainly four types of FDI, which include market-seeking, resources-seeking, efficiency-seeking and asset strategic-seeking. In the analysis of the determinant of FDI to the EAC, as a case study for the continent of Africa the focus is on three types of FDI – market, resource and efficiency-seeking. Beugelsdijk et al. (2008) studied the impact of vertical and horizontal FDI on the host's country economic growth from 1983 to 2003. They summarised different FDI types into two categories horizontal and vertical FDI. The horizontal FDI type relates to market seeking FDI while vertical FDI composed of efficiency FDI type. In addition, Ekholm and Forslid (2001) study on trade and location with horizontal and vertical multi-region firm grouped efficiency and resource seeking FDI under vertical FDI.

Reports available from the World Bank Group (World Development Indicator) on the East Africa gives an indication that the EAC region has varieties of resources. These resources include but not limited to extractive minerals like crude oil and other non-extractable resources. And based on the endowment of natural resource we argue that the EAC region attracts resource-seeking FDI because of her natural resources. Also, most empirical studies
suggest that a countries with high availability of natural resources attracts resource-seeking FDI (Asiedu, 2006; Dupasquier and Osakwe, 2006; Morisset, 2000)[3].

In terms of human resource availability, report from the United Nation Conference on Trade and Development (UNCTAD) indicate that in the EAC region, the total population in the year 2019 was estimated to be at 183,212 million. This figured opened up new possibilities as it can be argued that the growing population with a huge demographic composing mainly of young

people can serve as a source of cheap labour and large domestic market to be exploited by MNCs in the form of FDI. Therefore, one can easily conclude that a large market size and large population has the potential to attract both market-seeking and efficiency-seeking FDI.

The asset-seeking FDI is one of many other FDI theories that have been excluded from this study and the reason being that there is lack of data. The lack of data can be an implication of many things but one the possible cause is the likelihood that there are limited researched conducted on the EAC but also an issue of meagre investment in research. More generally, it is likely that private and commercial partners are not willing to engage in research and development (R&D), thereby, resulting in either no or fewer patent right registration. Furthermore, unlike in the European countries, mergers and acquisitions deals are almost non-existent in the EAC region. For instance, we observed that the proxies for asset seeking FDI variables seen in current empirical studies consist of patents registration (Drogendijk and Blomkvist, 2013) or mergers and acquisitions variables (Okafor et al., 2015).

From the abstract, we noted that EAC member countries have recently received less amount of FDI in absolute. From a policy standpoint, it is imperative to understand the critical driver of different type of FDI to the EAC region. The idea is to provide the right policy prescriptions to EAC practitioner to better design and implement policies suitable to different foreign investors in order to attract more FDI to the region. In studying empirical output from panel data studies, time series, empirical surveys and qualitative study, the aim is to identify research gaps, which will in turn inform the decision that will facilitate the development of conceptual framework in addition to variables selection. Further, while the aim is to understand the research gap in relation to determinants of FDI to the EAC, we also pay attention the way existing scholarship has characterised and explained the different factors that different factors that impact on how FDI is attracted to the EAC region.

We started by providing an empirical discussion on panel data studies, and then followed by times series. While empirical surveys and qualitative studies that involve more than one country, we discussed under panel data studies.

[3] See studies that made reference on availability of Africa's natural resource on vertical FDI (i.e.resource seeking FDI type). These empirical literatures are; Onyeiwu and Shrestha (2004); Asiedu (2003); Basu and Srinivasan (2002); Kolstad and Tondel (2002).

2.3.1 The review of the FDI empirical literature (Panel data studies)

In this section of the chapter the discussion is about the panel data studies on FDI determinants, with a focus on sub-Saharan Africa. It has been observed that there is a consensus that most of the FDI to the Sub-Sahara Africa (SSA) region are mainly market and resource seeking type. This is based on existing scholarship that have explored the determinants of FDI on a regional bloc like the Economic Community of West African States (ECOWAS), which have found that market size and resource availability are fundamental in attracting FDI to the region (see Anyanwu and Yameogo, 2016; Ajide and Raheem, 2016). The study conducted by Anyanwu and Yameogo (2015) span a period of over four decades from 1970 – 2010, which involves two estimation techniques; Generalised Method of Moments (GMM) and Pooled Ordinary Square (POLS). In a similarly approach, Ajide and Raheem (2016) applied GMM, with their study period covering a period of thirteen years from year 2000 – 2013. In both studies, other factors other than market size and natural resources that might attract FDI to the region were controlled and this is because these variables are traditional variables that are usually included by scholars when one is studying the determinants of FDI to developing countries.

Some of these variables are inflations, institutional quality (Asiedu, 2006, 2004)[4], exchange rate and political risk. African continent is widely considered to possessed economic and political uncertainties and so literatures on FDI determinants have accounted for political instability as well as economic uncertainties (Dupasquier and Osakwe (2006); Fedderke and
Romm (2006); Morisset (2000); Asiedu 2006, 2002a; Yasin 2005; Lemi and Asefa 2003; Schoeman et al. 2000)

Unsurprisingly both studies found that macroeconomic instability proxy by inflation deters FDI to the region. These make sense as inflation reduces assets values for foreign investors. In the context of the location theory which seems to argue that a country with a stable political climate attracts FDI, Ajide and Raheem, (2016) found that during their study period, the weak institution in the ECOWAS region did not deter FDI to the region.

This gives an indication that foreign investors would prefer to enter into a contractual agreement with corrupt government agencies as they stand to gain

[4] See empirical studies that have included institutional quality variables while study determinant of FDI in Africa are; Dupasquier and Osakwe (2006); Fedderke and Romm (2006); Emery et al. (2000); Te Velde (2001); and Asiedu (2003).

Further, these studies reveal essential information about the estimation technique, as in both cases the same estimation technique were used and similar conclusion were derived. However, the implication is that in any study using the same estimation techniques, which involve regional studies or countries that are relatively homogenous, it is unlikely to produce dissimilar empirical findings.

In a different but related study, Vinesh et al. (2014) examined the factor responsible for FDI inflows to the South African Development Community (SADC) region and the study takes into consideration the period from the year 1985 – 2010. The study was designed and conducted by adopting methodology from studies conducted by Argwal (2011), Quazi (2005), Asiedu (2006, 2002), Sekkat et al. (2004) and Mody (1992). The results from the adopeted methods were similar to those of Anyanwu and Yameogo (2016) and Ajide and Raheem (2016). Moreover, to enable them to capture the short and long-run relationship between FDI and locational factors such as resources, market size and education, Vinesh et al. (2014) applied PVECM and PVAR model respectively. Also, they noted that to capture sources of variations in their study, they used generalised impulse response functions and variance decomposition. From their findings, the results suggest that the availability of natural resources and market size, in addition to human capital were responsible for attracting FDI to SADC regions. They also noted that this happened both in short and long-run during the study period and Vinesh et al. (2014) empirical results should not come as surprising.

In our study of data from the World Bank, which was accessed through the website, there was a strong indication that the SADC member countries are generally wealthier in terms of GDP and GDP per capita compared to the rest of African regions such as; Central, East and West Africa. In addition, it was observed that the SADC region boast of a variety of mineral deposits, which is evidence from a country like Namibia that has diamonds, copper, gold, uranium, among other minerals. However, in South Africa and Zimbabwe, both have large deposits of gold and copper mineral, respectively. Unsurprising, therefore, that Vinesh .et al (2014) studies found the SADC to have attracted both the market and resource seeking FDI, a result .supported by location theory. According to location theory, it suggests that countries or regional trading bloc with large market size and natural resource viability would mainly attract both the market and resource seeking FDI respectively.

[5] Also see empirical studies consisting of effect of economic and political uncertainty in Africa, were findings suggest it discourages FDI to the continent (Onyeiwu and Shrestha, 2004; Asiedu, 2003; Martin and Rose-Innes ,2003; Rogoff and Reinhart, 2003; Kolstad and Tondel, 2002; Haque et al., 2000; Jaspersen et al., 2000; Collier and Pattillo, 2000, 1997; Sachs and Sievers, 1998)

Furthermore, some studies have generally looked at the determinants of FDI in SSA region in general, without necessarily concentrating on any specific trading bloc like ECOWAS. By using GMM estimation, their findings are like those studies that focused on the trading region (bloc). In other words, they concluded that most FDI to SSA is mostly resource and market-seeking FDI. In a slightly different study, Cleeve et al. (2015) assessed the role of human capital in attracting FDI to 35 African countries from 1980 – 2012. They applied various estimation techniques such as FEM, POLS, REM, and EGLS method. The Hausman test was deployed to facilitate the selection of an appropriate estimation techniques select (i.e. FEM or REM). They test for the presence of heteroscedasticity in the REM panel estimate. And accounted for serial correlation as seen in their FEM and EGLS estimation. From the study, they found that market growth rate, natural resources and trade openness significantly played a critical role in attracting FDI during the study period. From their study, it appears that resource-rich countries attract more FDI in terms of volume than the market growth rate. In Cleeve et al. (2015) study, we found that the traditional variables like human capital also encouraged FDI flows to Africa. It also demonstrates the importance of natural resources to foreign investors. Therefore, Cleeve et al. (2015) empirical results found refuge in Asidue's (2006) study. Along with Asidue, Cleeve et al. they both found that natural resource significantly attracted FDI to 22 SSA countries that market size. Broadly speaking these provide empirical evidence that helps to demonstrate that SSA countries have indeed attracted market and resource seeking FDI (Brafu-Insaidoo and Biekpe 2014; Bartels et al.
2009; Naude and Krugell, 2007). For example, Brafu-Insaidoo and Biekpe 2014 study involved two studies period. That is period spanning from 1980 – 2009 involves 37 SSA while the second study period starting from 1975 to 2009 involves 13 countries (referring
them as emerging or frontier countries). They applied GMM to capture the determinants of FDI to these countries. The advantage of GMM as they pointed out, allow for pooling data allows for time series and cross-sectional analysis in addition to the increasing degree of freedom. Their empirical results show that regionalism significantly attracts MNCs in the form of FDI. In other words, a unit increase in regionalism from 1980 – 2009 resulted in an increase of FDI activities into the region by 0.76.

Along with this argument, as EAC member intend to add Somalia to the trading bloc, we would expect FDI activity to increase as a result of expansion in the EAC region. Furthermore, they noted that from 1975 – 2009, natural resource availability played a crucial role in attracting FDI to the 13 countries. The credibility of their study lies on more extended study periods, which lead to large sample size hence providing a meaningful outcome. The recent study by Brafu-Insaidoo and Biekpe (2014) are in line with Anyanwu (2011) studies. Anyanwu examined

determinants of FDI to Africa from 1980 –2007 and applied POLS and GLM estimation techniques and found mainly market size, and natural resource availability offered a meaningful explanation as to why FDI was attracted to Africa. However, they found that financial development deters FDI to the region. Anyanwu argument was that it indicates that the countries have enough liquidity so they would be faced with more competition from domestic investors as they can easily access affordable investment finance. However, we argue that it is possible that foreign investors might want to raise investment capital domestically. Therefore, financial development might be attractive to them, both in terms of raising funds and repatriating revenues to their country of origin. Further, we studied the empirical evidence from Naude and Krugell (2007) and Onyeiwu and Shrestha (2004). We found that they are similar in terms of study periods and different concerning their methodological approach. For instance, Naude and Krugell (2007) study period range from
1970 – 1990 and applied GMM estimation techniques. Conversly, Onyeiwu and Shrestha (2004) study applied Fixed Effect Model (FEM), with study period starting from 1975 – 1990.

We found that the result from both of these studies suggest FDI was attracted to SSA economies because of their market size and resource availability. Furthermore, Naude and Krugell studies indicate that geography (i.e., proxy by landlocked and land area in kilometre) did not have any influence on foreign investors. However, Onyeiwu and Shrestha's findings show that tax reduction and an increase in the country's external debt had a positive effect on FDI to SSA countries. Onyeiwu and Shrestha's indicate that a country in financial distress would offer tax reduction as they try attracting foreign investors. Broadly they, these two studies all found that macroeconomic stability, political stability and institutional quality during their study period attracted FDI. However, Kolstad and Wiig (2011) studied the determinants of FDI to Africa from 2003 – 2006. They utilised OLS as their estimation techniques. Kolstad and Wiig found FDI to the 29 African countries were attracted to market size and natural resource availability. Market size played a key role than natural resources. Controlling for the institutional quality measure, the significance of market size in attracting FDI reduces while natural resources turned unattractive to the Chinese investors in the presence of institutional quality. For instance, they noted, most Chinese FDI went to Sudan, Algeria, Nigeria and South Africa. First, most of these countries have weak institutions except South Africa. However, they are both rich in terms of natural resource and market size. Hence Kolstad and Wiig's study is supported by location theory and recent empirical findings (Brafu-Insaidoo and Biekpe 2014). Although the weakness lies in its short study period, not long enough to offer reliable information about FDI determinants, besides OLS might not control for endogeneity problems that might arise in the

model.

In line with Kolstad and Wiig (2011) study that considered 29 countries in SSA, Suliman and Mollick, (2009) also investigated the determinants of FDI to 29 SSA countries from 1980 – 2003. Moreover, they used the fixed-effect method to estimate. They applied the cross-section weights technique (CSW), assuming the presence of cross-section heteroscedasticity and contemporaneously uncorrelated residuals. By applying seemingly unrelated regression (SUR) weighted least squares technique, assuming both cross-section heteroscedasticity and contemporaneous correlation these would improve the reliability of their outcome. Although they focused on human development and the war in attracting FDI, they included market size variables. They found that the motive for MNCs investing directly to these countries because of market size[6]. They noted that human capital (literacy rate) and political stability were considered vital in attracting FDI during the study period.

In the year 2006, Kandiero and Chitiga explored the attraction of FDI to 50 African countries from 1980 – 2001. Also, in the same year, Asiedu (2006) also conducted a study on the determinants of FDI to the 22 SSA countries. Kandiero and Chitiga, and Asiedu all found that market size and resources contributed to the FDI to the African economies. Besides, Asiedu findings also show that natural resource availability also encouraged FDI to the 22 SSA countries. However, Kandiero and Chitiga seem more reliable as it applied three estimation techniques, namely; POLS, FEM and GMM, While Asiedu only applied FEM. Moreover, Kandiero and Chitiga studies show that in openness to trade reduces FDI that goes to the primary sector by 0.06 units for an additional increase in trade openness. However, trade liberalisation seems to have significantly benefited both the service and manufacturing sector by 0.04 and 0.05 for every increase in trade openness. What this study suggests is that although African countries attract resource FDI, they do not seem to be interested in competition. It also appears that they extract resources, processed them and service both domestic and international markets as a result of the attractiveness of trade liberalisation to service and manufacturing sector. Furthermore, Kandiero and Chitiga studies show that tax and wage increase is detrimental to FDI. Finally, both Kandiero and Chitiga and Asiedu found that political instability macroeconomic stability and poor institutional quality discourages FDI to the SSA countries.

[6]Further, most empirical literatures that looked at determinants of FDI in Africa found that Market size, in addition to market growth rate plays an important role in attracting market seeking FDI. Therse literatures includes Dupasquier and Osakwe (2006); Fedderke and Romm (2006). Asiedu (2006, 2002a,); Yasin (2005); Onyeiwu and Shrestha (2004); Asiedu (2003); Lemi and Asefa (2003); Bende-Nabende (2002); Basu and Srinivasan (2002); Morisset (2000); Bhinda et al. (1999); Elbadawi and Mwega (1997); Bhattacharya et al. (1996); Agodo (1978).

Rodriquez-Pose and Coles (2017) investigated the role of good governance in determining the FDI in SSA from 1996 – 2015, and they considered twenty-two economies. Rodriquez- Pose and Coles utilised POLS estimation techniques. We note that necessary diagnostic test was carried to guarantee the reliability of estimates (i.e. Rodriquez-Pose and Coles carried out normality test o residuals, heteroscedasticity, and autocorrelation test). Rodriquez-Pose and Coles studies suggest that natural resource (i.e. oil and mining) and institutional quality significantly attracted FDI the twenty-two SSA countries during the study period. Conversely, we not that market size seem to have deterred FDI into SSA from 1996 – 2015. Moreover, Rodriquez-Pose and Coles study indicate that macroeconomic instability, unlike human capital, negatively impacted on FDI to SSA. In the context of market size, we found Rodriquez-Pose and Coles (2017) contradict Bende-Nabende (2002) results which suggest FDI to Africa are market seeking. For instance, Bende-Nabende (2002) study on the FDI determinants in the nineteen SSA countries found that that market growth was more influential than current market size. Moreover, based on Bende-Nabende panel co-integration VECM analysis, it appears that SSA countries under study did not receive efficiency-seeking FDI as there was no relationship between FDI and real wage (a proxy for efficiency-seeking FDI) and that trade liberalisation played a limited role in attracting FDI to SSA region. Furthermore, although they found all the SSA region attracted efficiency FDI (proxy by trade openness, return to capital and human capital, it seems that asset-seeking FDI was more attracted to West and Central SSA economies. What this study reveals is that there exists regional disparity in terms of FDI distributions. In the year 2014, Mijiyawa studied the determinants of FDI to Ghana and the rest of West African countries. Moreover, Mijiyawa applied two study periods ranging from 1970 – 2002 and from 2003 to 2011. The Mijiyawa analysis consists of mean value comparison. Therefore, the result shows that Ghana shows an improvement in her trade openness and human capital from the year 1970 – 2002 to 2003 –
2011 than the rest of West Africa. Based on Okafor et al. (2015) proxy for efficiency-seeking FDI (i.e., human capital, trade openness) it could be argued that Ghana received more efficiency FDI than the rest of West African countries.

Drogendijk and Blomkvist (2013) studied the critical motive of Chinese FDI from 2003 – 2009 in the 47 African countries. They wanted to understand if the African economies were attracting resource, market and strategic asset seeking Chinese FDI. Using OLS estimation techniques, they found that variables such as trade openness, market resources (mineral ore) and patent rights registration (strategic asset seeking) attract Chinese FDI. For examples, most market-seeking Chinese FDI went to South African and Nigeria, while resource seeking FDI went to South African and Kenya. Moreover, African countries that attracted the Chinese strategic

asset seeking FDI were South Africa, Rwanda and Kenya. We found that the weakness of this study might in its short study period of only six years. Not long enough to offer credible output. Non the less, given the economic size and mineral deposit of south Affric, it makes sense that different Chinese FDI types such as market, resource and efficiency seeking FDI is attracted to South Africa.

Bartels et al. (2009) studies took the form of a qualitative approach. They wanted to understand if there is variation in terms of factors considered relevant to initial and existing FDI in SSA countries. To do this, they considered 10 SSA economies and sent our 2, 195 surveys, although the response was only 35% this might not accurately represent the full picture of factors considered relevant to foreign investors in 10 SSA economies as the response rate is meagre. None the less, it provides useful information regarding understanding FDI motives. In their analysis, Bartels et al. (2009) subdivided factors deemed attractive to FDI into incentives and location factors. Their findings suggest that political stability and infrastructural development was crucial in attracting both the initial and current FDI in SSA. Interestingly, their results show that, unlike current FDI, market size in the form

of local, regional or country's access to the international market were considered least factors that motivate initial FDI. Moreover, it appears that incentives designed to attract FDI were such as, purchase or lease equipment were cited to critical, whereas tax reduction and labour costs were insignificant to both the initial and current FDI. On the available evidence, it seems FDI different factors attract a different type of FDI and different stages. However, market size, political and infrastructural development emerge as the most important factors considered by MNCs that wishes or are currently investing in the 10 SSA economies. Asiedu (2004) studies have echoed Bartels et al. (2009) findings.

Moreira (2008) conducted an empirical survey to understand factors attracting FDI to Africa. Moreira analysed ten economics journals of empirical literature obtained from Econlit database from 1969 – 2007. Moreira concluded that African countries' natural and mineral resources in addition to market size played a significant role in attracting both resource and market-seeking FDI. We also observed that traditional factors usually included when study determinants of FDI to African such as inflation and exchange rate volatility, poor infrastructures and political instability discouraged FDI to the African. Asiedue and Lien (2004), for instance, observed that policy variables such as trade openness, infrastructural development and quality institutions were responsible for FDI inflows to SSA. By comparison, Asiedu notes that although these policy variables have improved, it enables SSA countries to attract 18.5% of the FDI, although less than on average what developing countries received (i.e. 30.1%). Moreover, Asiedu noted that electricity as a location factor had impeded on MNCs' decision to invest in SSA directly.

Besides, labour force growth was also influential in attracting FDI to the SSA. The recent study by Blonigen (2005) captured Aseidu's empirical observation. By reviewing empirical pieces of literature on determinants of FDI inflows, Blonigen focused mainly focused on tax, treatment, trade, exchange rate and institutional quality. From Blonigen's observations, it became clear that SSA countries should improve on their institutional quality by combating corruptions and reducing bureaucracy as seen in the 1980s and strengthen rural of law as reflected in the 1990s. In this way, SSA economies will attract the necessary FDI required to promote economic growth.

Moreover, Malgwi et al. (2006) attempted to understand what motivate firms from the United States of America (US) to invest in a different part of Africa. Although their approach is qualitative, similar to the study of Bartels et al. (2009), it seems to motivate the US firms investing directly in Africa is the same as those of China. Their study indicates that US MNCs prefers to invest in Southern African countries with Central African being the least.
We argue that this could be due to the presence of substantial market size, political stability, institutional quality like the rule of law and control of corruption in the Southern African region. However, given countries with natural resources, US firms seem to be insensitive to weak institutions of such host countries. For instance, out of 576 divisions of US firms, Angola, Zimbabwe, Libya accounted for 15, 56 and 13 firms. While Egypt accounted for the largest, with 65 firms, this qualitative study shows that, like China, the US MNCs in the form of FDI mainly invest in Africa to service domestic market and access Africans' vast natural resource like gold and crude oil.

However, this does not negate the fact that institutional quality and political and macroeconomic stability plays a vital role in the overall decision-making process of the US MNCs when deciding to invest directly in Africa.

Recently, Olatungi and Shahid (2015) studies based on case study approach and trend analysis from 1977 – 2001 indicates that Sub Saharan African countries that experienced political instability tend to receive less FDI vis-à-vis often unaffected countries. This study demonstrates the relevance of political stability in attracting FDI. The idea is that for the market, resource or efficiency-seeking FDI, political stability reduces the costs of doing business in the country. They noted that from 1977 – 2001, Kenyan's FDI inflows was volatile, accounting for only 0.6% of GDP, smaller than Continents average, which stood at
1.9%. Although they noted that FDI to Kenya was resource and market-seeking in Nature, as some went to agricultural and cement industry. Olatungi and Shahid's analysis also suggests, due to sound macroeconomic policies, in addition to political stability and resource availability in Namibia, that the country received resource seeking FDI. There is evidence in

their analysis as Namibia has a resource like the diamond and Uranium ore. These mineral deposits are attractive to resource seeking FDI. Moreover, they observed that Lesotho, which is politically stable economy have also witnessed FDI in a different sector of the economy. We note that Olatungi and Shahid analysis on the determinants of FDI in SSA countries is not different from previous studies.

For example, Darley (2012) also examined the public policies challenges facing practitioners in designing policies to attract FDI to SSA African countries. Darley applied Porters (1990) five forces analytical framework to understand the country's competitiveness. This framework tends to highlight factors that impede and promote FDI to the host countries. Darley's observations were not surprising. For example, factors such as poor infrastructures like roads, telecommunication, and inconsistent supply of energy (electricity) added to the costs of doing business in SSA. Dupasquier and Osakwe (2006); Asiedu (2006, 2004, 200a); Lemi and Asefa (2003) and Morisset (2000) all found that the quality and quantity of infrastructure is essential if African countries were to receive large volume of FDI[7]. Besides, Darley also found that countries that engage in regional trade agreements like the SADC, EAC, ECOWAS, and COMESA would attract more FDI. This observation implies that SSA economies might be attracting market-seeking FDI. In this context, we argue that by SSA economies joining the trading bloc, it would tremendously increase their chances of receiving more market-seeking FDI.

Asiedu (2002) study involving looking at factors that affect FDI in developing, by comparing whether factors that affect FDI to non-SSA economies (developing countries) are the same to those of SSA economies. The study period ranged from 1988 – 1997. The OLS estimation technique was applied to capture factors. Asiedu pointed out that higher return on investment and better infrastructural development in the non-SSA countries attracted FDI. In Asiedu empirical evidence, we found that less return to investment and poor infrastructural development in SSA (except for South Africa and Botswana) deterred FDI compared to non- SSA countries. However, we found that trade liberalisation seems to have a significant effect on FDI to non-SSA and SSA economies. We found that political and market size variables were insignificant. Asiedu's finding shows that due to heterogeneity among developing countries, different policies work for different sets of countries or region. Therefore, countries or regional bloc should focus on policies that might influence FDI to the region. Furthermore, Asiedu and Lien (2011) study democracy and natural resources as the determinant of FDI in 112 developing from 1982 – 2007. They applied GMM estimation. The findings suggest there were 90 countries were democracy played an essential role in attracting FDI. These countries were countries that had less mineral and oil resources. While the 22 countries which had a vast amount of natural

resources in the form of minerals and oil, the democracy in those countries seems to have negatively affected the FDI flows to those countries. Moreover, they also found that market size attracts FDI only if people can purchase their products.

In Asiedu (2002) study, we note that SSA will attract market-seeking FDI only if the citizenry meets per capita threshold deemed necessary to buy foreigner investors goods domestically produce. In a different scenario, Naude and Kruggel (2007) examined the influence of geography and institutions as a determinant of foreign direct investment in Africa from 1979 – 1990. The findings show that human capital, compared to a market size, significantly attracted FDI to the region. In other words, the last year market growth rate compared to the current market growth rate has a positive effect on the attraction of FDI to African countries. Although regulatory quality attracted FDI to Africa during the study period, the measurement for institutional quality like the rule of law and accountability negatively impacted on the FDI inflows to the region.

Some authors conducted a comparative analysis, and their findings seem to indicate that countries geographically located apart or in different trading bloc might receive a different type of FDI. We argued that these scholars seem to be interested in understanding the regional distribution of FDI in African. For example, the study by Okafor et al. (2015) divided SSA economies into two groups. That is South and East SSA economies and West and Central SSA economies. They applied three estimation techniques and the aim of using these techniques just like in the study of Cleeve et al. (2015) might be to enable them to obtain reliable output. Therefore, Okafor et al.'s consist of POLS, FEM and GMM, and the study year covers the period of 1996 – 2010. Okafor et al. (2015) analysis suggests that South and East SSA region attracted market-seeking FDI than Central and West African regions.

However, for West and Central, their studies show that the region had the vast amount of natural resources during the study period, although they also found that the region had the higher level of corruption with less human capital development than South and East SSA region. Based on reviewed empirical literature, the African countries need to improve their macroeconomic management, political stability and institutional governance in order to attract different types of FDI.

[7] Further literatures that considered quantity and quality of infrastructure in Africa and found then be influential in minds of MNCs are Onyeiwu and Shrestha (2004); Asiedu (2002b, 2003); Pigato (2001); Bhinda et al. (1999)

2.3.2 The review of the FDI empirical literature (Time-series Study)

In this section of the chapter, we explore the time series studies on the FDI determinants in Africa countries and the discussion build up around the scholarship of Armah and Fosu (2018) In the year 2018 Armah and Fosu studied the determinants of FDI in Ghana taking into consideration a period between 1975 and 2012 and the study was based on the Two- Stage Least Squares (2SLS) developed independently by Theil (1953) and Basmann (1957). This approach seems more reliable in providing adequate and verifiable estimates compared with simple OLS, which have been observed to be inadequate in controlling for endogeneity in the case study.

Armah and Fosu reported that macroeconomic instability proxy by inflation and high external debt significantly accounts for the reduction of FDI to Ghana during the study period. We noted that Armah and Fosu conducted a necessary diagnostic test to ensure the consistency and reliability of the estimates. For example, the Armah and Fosu (2018) tested for and corrected the presence of heteroscedasticity and autocorrelation in the time series variables. Besides, Armah and Fosu also applied the Hansen J statistics test to select the right instrumental variables to be used in the study, further strengthening confidence in their empirical results. We also note that by not controlling for endogeneity, the estimation might result in a sporous outcome. Therefore, Armah and Fosu result based on OLS and IV (2SLS) estimation suggest that a unit improvement in the market size would significantly attract FDI to Ghana by 0.264 units.

Warmerdam and Dijk (2016) decided to analyse the data collected by the Bank of Uganda, through the medium of private sector investment survey (PSIS). Warmerdam and Dijk studied the collected data of forty-two Chinese enterprises that were operating in Uganda and they found that most Chinese firms were in Kampala, the capital city of Uganda. It was reported that most Chinese firms were attracted to Uganda because of the market, which resonate with the argument presented by Dunning's (1993) where it FDI type were classified and Chinese firms in Uganda we consider to be market seekers. We found Warmerdam and Dijk's (2016) analysis concur with Obwona (2001) earlier study. In the case of Obwona, attempt was made to capture the determinants of FDI to Uganda through triangulation approach, which involve the use of primary data (collected by survey) and secondary data (i.e., existing data from the Bank of Uganda and the World Bank database).

Obwona‘s annual time series data range from 1975 – 2001 and it was considered long enough to give reliable information.

We cautioned the reliability of the results from Warmerdam and Dijk (2016) and Obwona (2001) studies but assert that survey data is prone to subjectivity; respondents are likely to provide responses that suit their interest. We observed that Obwona’s study suggest that foreign investors are directly investing in Uganda to service the domestic market. Further, the political instability and shortage of electricity supply was unpopular to foreign investors and this led us to conclude from Obwona’s study that FDI to Uganda during his study period is market and efficiency seeking FDI. For example, electricity could be a good proxy (because it is a significant cost met by any investors) for efficiency FDI in the context in Uganda economy and EAC region general. In a more recent analysis, Wekesa et al. (2016) examined the influence of infrastructure development as a determinant of FDI in Kenya. The study applied multiple linear regressions on data ranging from 2010 – 2013, and they collected the secondary data from the Central Bank of Kenya and the World Bank. It was reported that market growth rate, transport, communication and energy infrastructure significantly accounted for the FDI in Kenya. A downside to this report was that the study period is not long enough to provide any meaningful results but we found that the study despite its weakness produce similar outcome, as presented in Njoroge et al. (2015) and Obwona's (2001) studies.

In Njoroge et al. (2015) study of the determinants of FDI in Kenya, we observe that in the context of methodology, there is similarity with Obwona's (2001) study as both reported results on annual time series data but there were areas of contrast. Obwona study contrasts with Njoroge et al. in the sense that it purely focused on Uganda economy while the latter looked at Kenya. We also observed that although Uganda and Kenya are different countries, they share borders and are a founding member of the EAC. Besides, they are homogenous in that they are both labour intensive economies. Njoroge et al. result from both time series analysis and qualitative study (i.e., analysis of primary data collected through a semi- structured questionnaire) suggest foreigners were attracted to the manufacturing sector in Kenya. We believe in the context of Kenyan's economy that the country received market- seeking FDI, where foreign firms manufactured goods to service local market. Njoroge et al. also pointed out that institutional quality also played an essential role in attracting FDI into Kenya. We observed that the weakness of Njoroge et al. study, unlike Obwona (2001) lies is in the the short period of four years (i.e., 2009 – 2013) not long enough to give reliable information about factors attracting FDI in Kenya.

Another analysis was presented by Schoeman et al. (2000), where they examined whether there was a relationship between fiscal discipline and FDI in South Africa from 1970 – 1998. Schoeman et al. time series data collected from the South African Reserve Bank and the World Bank database. They estimated their model by applying Engel and Yoo three-step approach, also after capturing the presence of long-run equilibrium, the incorporated error correction method (ECM) to capture the short-run impact of the variables under study. They conducted diagnostic tests to ensure their model satisfies statistical requirements associated with good estimation. Schoeman et al. study shows that higher return on investment (ROI) and higher interest rate attracted FDI to South Africa. They suggest that corporation tax differential (the difference between home country tax rate and South Africa corporation tax) played a critical role in attracting FDI to South Africa. We argue that South Africa received efficiency-seeking FDI, (i.e., locating some part of their production facility) to South Africa because of lower production cost. Tuomi (2011) and Fedderke and Rommm (2006) recently studied the motives of FDI to South Africa. The result from Tuomi is similar to those of Fedderke and Romm in that South seems that received market and efficiency seeking FDI.

For instance, Fedderke and Rommm (2006), which involves time series annual data spanning from 1962 – 1996 applied VECM techniques. The study reveals that South Africa's market size significantly attracted direct foreign investments. Their findings also suggest that lower in addition to political stability and protection of property rights, the presence of lower import cost coupled with the opportunity to export locally produced goods played an essential role in attracting FDI in South Africa. We note that a recent study Tuomi supports earlier studies (Fedderke and Rommm, 2006; Schoeman et al., 2000). Tuomi studied whether tax incentive would attract FDI to South Africa. They conducted a qualitative study by sending a self-completed questionnaire to 136 foreign firms in the South. However, only 73 firms return the questionnaire survey. Tuomi reported that South Africa received market and resource-seeking FDI. We observed from Tuomi results that market size played a significant role in attracting FDI to South Africa. Moreover, Tuomi result indicates that the South Africa possible market growth rate was more critical to foreign investors than the openness of investors in South Africa to service other regional markets like Zimbabwe. Tuomi findings also suggest that the availability of natural resource was more significant than the corporation tax rate. We observe the difference between Tuomi (2006) and Schoeman et al. (2000) study in the context of Tax.
The latter seems to suggest that corporation tax differential was essential in attracting FDI to South Africa than the former.

Selelo and Sikwila (2012) also examined the determinants of FDI in Botswana from 1980 – 2007. They collected their annual time series data from the Bank of Botswana, Botswana Central

Statistics Office. Selelo and Sikwila conducted the co-integration test and vector error correction method (VECM) to capture short and long-run effect. Selelo and Sikwila reported that Botswana market potential attracted FDI into Botswana both in short and long-run. We also found traditional variable such as trade liberalisation, human capital and domestic invest to have a positive association with FDI. We have confidence in Selelo and Sikwila (2012) results as a diagnostic test to ensure their estimated model does not suffer from associated to the presence of heteroscedasticity and serial correlation, thereby, guarding the reliability of estimates. We note that caution is needed when interpreting Seleo and Sikwila's (2012) results due to the short study period of only seven years. We concluded from Selelo and Sikwila that Botswana attracted market-seeking FDI. Moreover, given that Botswana is a resource-rich country, we report that Botswana also attracts resource-seeking FDI (Makoni, 2015).

Makoni (2015) noted that Botswana natural resource (i.e. diamond) accounted for 50% of the country's GDP. We report that Makoni utilised the country-specific case approach in addition to studying FDI trend in Botswana and country national policies aim towards diversifying the economy away from the export-oriented natural resource (diamond) and other mining other minerals. Makoni concluded that Botswana is a resource-rich country and have attracted much of resource-seeking FDI. Mawugon and Qiang (2011) investigate the relationship FDI and economic growth in Togo from the year 1991 – 2009. We observed that the result from their pairwise granger casualty test shows that Togo significantly attracted market-seeking FDI. Mawugo and Qiang used Gross Domestic Product as a proxy for market size. We observed that Togo's market size in the year 2009 was petite (i.e., US$ 2854.60 in millions). We believe this explains Togo slowness to attract market-seeking FDI. In other words, previous year market size was responsible for market-seeking FDI to Togo. We note that the weakness of this study lies in its short study period of eighteen years that is not long enough to capture the genuine relationship between FDI and the market size of Togo's economy. Mawugon and Qiang (2011) study and Ussi and Wei (2011) present similar results. Ussi and Wei (2011) mainly investigated the location determinant for the hotel FDI in Zanzibar, economy relatively the same as that of Togo. Ussi and Wei adopt the qualitative approach, and therefore, sent 44 questionnaires through email to foreign investors in Zanzibar. We observe that Ussi and Wei study also included economic growth, political trade openness and labour costs – variables traditionally included in by scholars studying determinants of FDI in Africa. Ussi and Wei reported that economic growth, political stability and various tourism assets have significantly contributed to the FDI flow to Zanzibar. We note that both Togo and Zanzibar received market-seeking FDI. Furthermore, Zanzibar also seems to have attracted resource seeking FDI during the study period.

Yohanna (2013) examined the primary driver of FDI to Nigeria from 1981 – 2010 and applied the OLS estimation technique. Yohanna found that Nigeria attracted market-seeking FDI. We concur with Yohanna's empirical that Nigeria attracted market-seeking FDI. We looked at data from the World Bank database, and it suggests that Nigeria is Africa's most populated and largest economy (i.e.by GDP), and hence Yohanna's findings that Nigeria attracts market-seeking FDI is not surprising. Yohanna further reported that human capital and infrastructural development had a positive association with the FDI during the study period. However, we found that the exchange rate harmed FDI. Moreover, Udo and Eqwaikhide (2008) applied the GARCH model technique to the examined effect of inflation uncertainty and exchange rate volatility in Nigeria from 1970 – 2005. Udo and Eqwaikhide study support a recent study by Yohanna. Udo and Eqwaikhide reported that exchange rate volatility and inflation uncurtaining reduce FDI to Nigeria by 0.012% and 0.11% respectively for every 1% rise in the exchange rate and inflation. We concur Yohanna (2013) and Udo and Eqwaikhide (2008) empirical results as macroeconomic instability tend to increase the cost of running the business, besides, to reduce asset base for investors.

In our analysis, we found that Yohanna (2013) and Udo and Eqwaikhide empirical evidence we previously reported in the earlier Astatike and Assefa's (2005) earlier report based on OLS estimation. Although Astatike and Assefa's study is based on understanding determinants of FDI in Ethiopia and used annual data ranging from 1974 – 2001, we observed the similarity in the study of Astatike and Assefa's to those of Yohanna and Udo and Eqwaikhide. For instance, we found that they relatively used a more extended study period. Also, while Nigeria is the most populated country in Africa (as well as West Africa), Ethiopia is also the most populated country in the Eastern part of African hence positively associated to the market-seeking FDI. Therefore, it should not come as a surprise that both Yohanna (2013); Udo and Eqwaikhide (2008) and Astatike and Assefa's (2005) studies both found that market size, macroeconomic instability measured by inflation and exchange rate volatility discouraged FDI during the study periods.

2.4 Methodology

The understanding of the FDI theory and available empirical studies on FDI determinants in developing countries provided a basis for the formulation of the empirical equation, which is estimated using Pool Ordinary Least Square (POLS) and Fixed Effect Model (FEM) techniques. We provided our our empirical equation (2.3) seen under section 2.4.2 (empirical equation and results).

However, to achieve our research objective, the importance of research method cannot be ignored, and this forms the discussion in this section. The method discussed here are those required for the investigation of the determinants of FDI to the East African Community (EAC) region from 1970 – 2017. The economic model developed was based on the location theory, the model enables us to capture the relationship between FDI and its determinants (explanatory variables).

The data limitation undermines testing other FDI theories such as Aliber (1970) theory. Also, with regards to location theory, we were restricted to the testing of a particular model of location theory. These specific location factor includes market size, population size, natural resource availability on foreign direct investment. However, we could not study whether the EAC region recieved strategic asset-seeking FDI. The Strategic asset-seeking FDI is usually proxy by mergers and acquisition data. This data was unaviable for the EAC region.

The purpose of using location theory in developing the analytical framework is to help us understand different types of FDI received by the EAC region during the study period. Based on data availability, the three types of FDI examined in this study consist of resource–seeking, market–seeking and efficiency –seeking FDI. According to location theory, as discussed extensively in Chapter Two, it suggests that multinational corporations (MNCs) in the form of foreign direct investment (FDI) is attracted to host country's natural resources, large markets size and cheap, efficient labour force. Therefore, we adopted Breham (1972) FDI typology to different FDI types attracted to the EAC region's location advantage.

2.4.1 Analytical framework

Our analytical framework is based on the location theory and this was adopted as the conceptual framework because the theory assists us in understanding the direction and relationship of FDI and the EAC region’s attraction.

However, given that our case study involves the EAC region with a study period spanning from 1970 to 2017. Data availability became a problem in this study and so, we could not include

variables from other FDI theories like the Aliber (1970) and the Bhagwati (1978) hypothesis. Therefore, our approach does not include variables from all theories which could be empirically tested, and what is left would have given us an understanding about the data and the theories.

In this study, we use FDI inflows, as seen in Table 1. The concept FDI inflows refer to the inward direct investment made by investors from another country (non-residents) while FDI outflows refer to direct investment abroad.

Sane (2016, p.1518) defines FDI concepts based on World Bank definition as:

> *"Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital,*
> *reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments."*

Moreover, the UNCTAD database defines foreign direct investment (FDI) as

> *"an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)".*

Sane (2016) further stated that the FDI flows comprise capital provided (either directly or through other related enterprises) by a foreign direct investor to an enterprise, or capital received from an investing enterprise by a foreign direct investor. FDI has three components: equity capital, reinvested earnings and intra-company loans.

• Equity capital is the foreign direct investor's purchase of shares of an enterprise in a country other than its own.

• Reinvested earnings comprise the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates, or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested. World Investment Report 2007: Transnational Corporations, Extractive Industries and Development

• Intra-company loans or intra-company debt transactions refer to short- or long-term borrowing and lending of funds between direct investors (parent enterprises) and the affiliated

enterprises

However, because our research questions look at the determinants of FDI to the EAC region. The FDI inflows are preferred. Moreover, the EAC region consists of a small open economy which does undertake significant FDI because of inadequate investment capital.

Therefore, under location theory, the assumption is that FDI and location factors such as large market size, natural resource availability and pool of cheap labour force are expected to have a positive influence on MNCs decision makers to invest directly to the host country. In this context, when developing our conceptual model base on our case study (i.e., EAC region), we follow location theory by assuming a positive relationship between the FDI inflows and the EAC region's location factors such as resource, market size and labour force availability.

In other FDI inflows to EAC region is a function of market size, natural resource and labour force.

The argument in favour for and application of the variables market size, labour force and natural resource availability in this study are based on data availability, location FDI theory and existing empirical studies on FDI determinants. For examples, most studies included market size, labour availability and resources variables when study FDI motives to African economies (Drogendijk and Blomkvist, 2013; Suliman and Mollick, 2009; Asiedu, 2006). Therefore, data availability, location theory and reviewed existing empirical literatures on FDI determinants justifies selection of the market size, labour force and natural resource variable in this study.

Therefore, the model indicates that when the EAC region improves its location factors (market size, natural resources and labour force), it positively influences MNCs decisions makers to increase their investment to the EAC region. According to Breham (1972), FDI typology, this implies that the EAC region would receive different types of FDI inflows as the EAC region improves on her market size, natural and labour force base.

Therefore, based on location theory, our economic model that shows the relationship between FDI inflows and the EAC region's location advantages is seen below.

$$FDI_{i,t} = f(Market, Resource, labor)_{i,t} \quad (2.1)$$

Equation 2.1 is a simple economic model that captures the relationship between FDI inflows to the EAC region's market size, natural resources and labour availability. Where i stands for individual countries in the EAC region (i.e., Uganda, Kenya, Tanzania, Rwanda and Burundi). t capture the study periods, which starts from 1970, 1971…….2017. Moreover, the right-hand side of the equation is FDI inflows to respective EAC member countries. On the left-hand is EAC

region' market size, natural resources and labour force – made of individual EAC member countries.

According to our discussion of FDI theories, we observed that the key advantage of location theory rests in its breadth. The location theory enables us to formulate an economic model which allows us to include other FDI determinants variables that are usually included when studying determinants of FDI to African economies. We can group these control variables under policy, institutional and political risk variables.

Therefore, the economic model seen in equation (2.1) can be modified to accommodate other vectors of control variable X. The X variables (i.e., control variables) are grouped under the policy, institutional and political risks variables. Grouping vector of control variables into policy, institutional quality and political risk assist us to understand whether policy or institutional or political risk factors influence FDI inflows to the EAC region. By understanding what variables plays a critical role in attracting or deterring FDI inflows to the EAC region, based on our research findings, we can offer correct policy prescription to the EAC region. Based on the analysis of our empirical literature on FDI determinants to Africa, the variables expected to influence FDI inflows in the EAC region are presented in model (2.2), obtained from the transformation of the economic model (2.1).

$$FDI_{i,t} = f(Market, Resource, labor, X)_{i,t} \quad (2.2)$$

Therefore, our analytical model (2.2) takes into account vectors of control variable X.

2.4.2 Empirical equation and results

The understanding of the FDI theory and available empirical studies on FDI determinants in developing countries provided a basis for the formulation of the empirical equation, which is estimated using Pool Ordinary Least Square (POLS) and Fixed Effect Model (FEM).

In attempting to answer our research question, determinants of FDI inflows to the EAC region, the formulated theoretical model (2.2) based on location theory is tested.

In developing our empirical model, we followed the working of Sannassee et al (2014) Drogendijk and Blomkvist (2013), Suliman and Mollick (2009), Asiedu (2006).

All these scholars empirically studied the determinants of FDI to Sub-Saharan Africa (SSA). For instance, Sannassee et al (2014) studied the determinants of FDI in South Africa Development Committee (SADC) both in short and long run. Sannassee et al study not regionally looked at the motive of FDI but shows the effect of location factors on FDI both in short and long run, which is

like our study as we explore the key drivers of FDI to the EAC region in the short and long run period. Furthermore,

Suliman and Mollick (2009) studied the impact of human capital development and war on FDI in SSA countries from 19980-2003. They wanted to find out whether population development and absence of war might attract FDI to SSA countries. The Suliman and Mollick (2009) study is useful in this study as we explored whether cheap labourforce availability might influence FDI to the EAC region during the study period. We proxy efficiency seeking FDI with the labourforce availability in the EAC region. In addition, another key paper in this chapter were Drogendijk and Blomkvist (2013) and Asiedu (2006). These empirical papers assisted as in classifying FDI typology. For instance, Drogendijk and Blomkvist (2013) studied the key drivers and motives of Chinese FDI in Africa from 2003 -2009. They explored whether FDI to Africa were resource seeking, market seeking and strategic- asset seeking FDI. For example, they proxy market seeking FDI with GDP variables while resource seeking was proxy by ore and metals, patent registration for market and strategic asset seeking FDI was proxy by patent registration. Similarly, Asiedu (2006) when studying for the FDI determinants in the twenty-two SSA countries (from 1984 – 2000) also grouped vectors of control variables under policy, institutional and political risk variables. More importantly, the key variables of interest in the Asiedu study was natural resources and market size, in other word, Asiedu wanted to know empirically, whether the SSA countries were receiving resource seeking and market seeking FDI. Also, Asiedu paper helped us to classify our vectors of control variables into policy, institutional and political risk. Thereore, we contribute to existing literatures by looking at whether the EAC region received different types of FDI. From the study of empirical literature on FDI determinants, we did not find any studies on the EAC region (see discussion on research gape reported in Chapter one, page 20).

Therefore, our empirical model involves estimating a panel regression equation (2.3) seen below.

$$FDI_{i,t} = \beta_0 + \beta_1 Market_{i,t} + \beta_2 Resource_{i,t} + \beta_3 Labor_{i,t} + \sum_{k=1}^{k} \beta_{i,t} X_{i,k,t} + \mu_{i,t} \qquad (2.3)$$

Where $FDI_{i,t}$ is reflects FDI inflows to country i (i.e., Uganda, Kenya, Tanzania, Rwanda and Burundi) in year t. Year t is our study period, which spans from 1970, 1971….2017. While $\mu_{i,t}$ show idiosyncratic (i.e., specific) error term for country i in year t. Moreover, $Market_{i,t}$, $Resource_{i,t}$ and $Labour_{i,t}$ denotes the level of market size, resources and labour availability associated with country i and year t. Furthermore, to test the influence of other factors normally expected to influence FDI to African economies, we incorporated the vector of control variable $X_{i,k,t}$. Where kth is a control variable associated with country i in year t. The control variables included in equation (2.3) consists of policy variables, institutional quality, and political

risk variables (See Table 2.1 below).

Therefore, our study contributes to the existing literature on FDI determinants in developing countries by exclusively looking at determinants of FDI in the EAC region from 1970 – 2017 as simply looked at FDI determinants in the ECOWAS region (Ajide and Dolapo, 2016). Unlike other empirical studies (Cleeve et al,2015; Okafor et al, 2015) we classified FDI into different groups. That is market seeking, resource seeking and efficiency seeking FDI. From our review of existing empirical literatures of FDI determinants in Africa, we did not come across a study that investigated FDI determinants in the EAC region both in short and long run period. So, we extended empirical analysis on FDI determinants by investigating different motives of FDI to the EAC region both in short and long run period.

Table 2.1 shows dependent and explanatory variables applied to investigate the determinants of FDI in the EAC region from 1970 – 2017.

Variables	Definition	Measurement	Study period	Source
DEPENDENT VARIABLE				
FDIA	Foreign Direct Investment net inflows (% of GDP)	FDI	1970 – 2017	World Bank, WDI database
EXPLANATORY VARIABLES				
Key Explanatory variables				
GDP	GDP constant	Market size	1970 – 2017	World Bank, WDI database
Resource	Total Natural resources rents (% of GDP)	Resources availability	1970 – 2017	World Bank, WDI database
Labour availability	Population ages 15-64 (% of the total population)	Unskilled Labour	1970 – 2017	World Bank, WDI database
School enrollment	School enrollment, primary (% gross)	Human capital labour	1970 – 2017	World Bank, WDI database
CONTROL VARIABLES				
Macroeconomic Policy Variables				

Inflation	Inflation, consumer prices (annual %)	Macroeconomic instability	1970 – 2017	World Bank, WDI database
Government expenditure	General government final consumption expenditure (% of GDP)	Tax Policy/Fiscal Policy	1970 – 2017	World Bank, WDI database
Money supply	Broad money (% of GDP) (i.e., M2 as % GDP)	Financial sector development	1970 – 2017	World Bank, WDI database
Trade openness	Trade (% of GDP)	Trade Liberalization	1970 – 2017	World Bank, WDI database
Institutional Quality variables				
Telephone line	Fixed telephone subscriptions (per 100 people)	Telecommunication Infrastructure	1970 – 2017	World Bank, WDI database
Aid	Net Official Development Aid received per capita (Current US $)	Aid received	1970 – 2017	World Bank, WDI database
Political Risk Variables				
Political right	Political right: Estimates 1 - 7	Freedom status (Political risk)	1970 – 2017	Freedom House
Civil liberty	Civil liberty: Estimates 1	Freedom status	1970 – 2017	Freedom

	- 7	(Political risk)		House

When we consider estimation techniques in the existing literatures on FDI determinants in developing countries, the reviewed literatures shows some scholars favoured Pooled Ordinary Least Square (POLS) (Gastanaga et al, 1998). Others deployed fixed effect or random effect model (Shah, 2014) or combination of fixed effect model and GMM (Kandieroro and Chitiga, 2006). Some only used different type of Gneralised Method of Moments (GMM)(Asiedu and Lien, 2011). However Okafor et al (2015) in studying FDI determinants in Africa adopted three estimation techniques (i.e. POLS, FEM, GMM), moreover, Hsu and Tiao (2015) the recent study on determinants of FDI inflows to developing countries applied OLS, FEM, REM and SGMM. We observed that different estimation techniques can be applied when studying FDI determinants. We add that using more than one technique provide reliable and accurate results.

In this context, we applied POLS and FEM estimation techniques in the FDI determinant Chapter two. This would enable us to get reliable estimates (Shah, 2014; Gastanaga et al, 1998). This is because we found it to be widely used in the study pertaining FDI determinants in the developing countries.

For instance, in this study, if the country's specific effect over time is constant, and when time specific effect is not present, then POLS method is applicable, while if unobserved heterogeneity of the EAC member countries might result to country specific unobserved characteristics being correlated with the independent variables in the estimated model. The problem of unobserved heterogeneity in this study could be resolved by deploying fixed effect technique which controls for unobserved heterogeneity

There are two estimation technique applied in this study. That is Pooled ordinary least square (POLS) and fixed effect method. We start by briefly discussing POLS

2.4.3 Pooled ordinary least square (POLS)

We applied POLS if the country specific effect constant over time is constant, and when time specific effect is not present, then pooled OLS method is applicable, however the weakness of the pooled OLS is that, it ignores the assumption of individual specific effects and because of this, assumption such as orthogonality of the error term is completely violated

Another point to keep in mind regarding demerit of pooled OLS estimation method is that, there is likelihood of omitting important variables. We expect the omission of this variable in the case of this study might be due to limitation of data as discussed in the section pertaining challenges encountered in the data collection and processes.

In addition, another way of omitting relevant variables might be that the right variables are not included in the study period. However, in this panel data study, the problem of unobserved heterogeneity (i.e., also known as omitted variable bias) arising from unobserved variable in the error term that might be probably correlated with either one or more of the independent variables, and this, we can resolve it by utilising proxy variables for unobserved variable although it likely to error measured, or we can intentionally content with getting inconsistent estimator by ignoring problem associated unobserved. Another way unobserved variable in this study can be corrected is by simply assuming the omitted variables in the model are constant over the period and so estimation technique to take care of the unobservable heterogeneity. This leads us to the discussion of the fixed effect estimation technique.

2.4.5 Fixed effect model (FEM)

The unobserved heterogeneity of the EAC member countries might result to country specific unobserved characteristics being correlated with the independent variables in the estimated model. The problem of unobserved heterogeneity if exist in our study could be resolved by deploying fixed effect technique which controls for unobserved heterogeneity, alternatively we can regress the equation while assuming constant but that there is no presence of homogeneity in country specific effect hence resulting to fixed effect model. According to Wooldridge (2002), if the assumption in this study is that unobserved heterogeneity of the EAC member countries simply cause a shift in the parametric shifts of the regression function and so is either correlated with one or more of the independent variables, then fixed effect model provides the best fit. However, when individual country specific effects are correlated with either one or more of the independent variables (i.e., miss specification) in the model, then fixed effect techniques is used since random effect assumption is false and the estimator cannot provide satisfactory results.
In thesis we note that reliable instrumental variables must satisfy at least two important criteria. That is should statistically correlate with endogenous variable in the model (i.e., when all other exogenous variables are controlled) and should be theoretically justified (French and Popovici, 2011). Another important consideration pertaining to instrumental variable in the thesis is that it should control for any potential reverse causality and potential endogeneity problem (explanatory variable is correlated with the error term). Therefore, these instruments must be exogenous to all other relevant and unobservable factors. In other words, it should be uncorrelated with error term, which is normally referred to the validity condition (French and Popovici, 2011).

Therefore, to ensure that instrumental variables are significantly correlated with the endogenous regressor once other exogenous explanatory variables are controlled, and that our instrumental

variables are uncorrelated with the error term, we conducted Sargan tests. According to Angrist and Krueger (2001), a good instrumental variable is correlated with the endogenous regressor of which the reason for this correlation can be verified and explained by the researcher – and that the instrumental variable is uncorrelated with outcome variable for the reason beyond the effect on the endogenous regressor.

The method for selecting instrumental variables in this thesis is guided by our economic knowledge and intuition. For instance, the instrument for FDI inflows could be lagged FDI inflows, FDI stock or FDI net inflows (% GDP) and the validity of the selected instrument is subject to Sargan test.

Sargan (1958) reported that the estimates are always consistent when appropriate instrumental variables are use in the model. Therefore, to test the appropriateness of the instruments used in the model, we applied Sargan test.

For the theoretical, statistical and application of instrumental variables see workings of Andrews et al., (2019), Farhi and Werning (2016), Sargan (1958).

However, before we provide our empirical results, we started by discussing briefly the summary of the descriptive statistics. The descriptive statistics enables us to present the variety of data for the EAC region spanning from 1970 to 2017 in a more meaningful way, thereby, allowing for simpler interpretation of the large amount of data.

From Table 2.2 below, the summary our descriptive statistics covering period 1970 to 2017 suggests that market size for the EAC region on average stood at US$ 8.89 billion. We think that the low level of market size was a result of poor macroeconomic policies such as high inflation rate. The average high rate of inflation from 1970 to 2017 seems to demotivated economic actors from fully engaging on economic activities that supports economic growth. Moreover, the mean value for aid (proxy poor institutional quality), low infrastructure and underdeveloped financial sector further impede on the economic progress of the EAC region.

In terms of labour composition in the EAC region, from 1970 to 2017, the mean value for labour force is 50.76. This is roughly above 50% mark. We consider this weak enough to significantly influence FDI to invest in the EAC, even though there seems to be high potential of human capital as reflected by mean value of 85.33% for primary school enrolment (%gross).

Moreover, according to Freedom House website, the EAC region is still considered less democratic, characterised by restricting civil liberty and undermining freedom of political parties

to hold incumbent government accountable. Given that value 1 represent absolute democracy and 7 not democratic, The mean value for both civil liberty and political right are above average which indicate to potential foreign investors that they could lose their investment in case of civil war as a result of political or constitutional crisis. Also, it suggests that these countries are corrupt as political leaders and public servants might not be held be held accountable for their wrongdoing.

We believe factors such poor macroeconomic management; political instability among others could have impeded the FDI inflows to the region, thereby possibly explaining the EAC regional mean value of 2.49 of the FDI net inflows (% of GDP) from 1970 to 2017.

Therefore, empirically analysis on the determinants of FDI to the EAC region is reported in Table (2.4), (2.6) and (2.8). Where Table (2.4) report findings on efficiency seeking FDI, while Table (2.6) and (2.8) shows results on market seeking FDI and resource seeking FDI respectively.

Table 2.2 Shows descriptive statistics for variables use in studying determinants of FDI to the EAC region from 1970 – 2017.

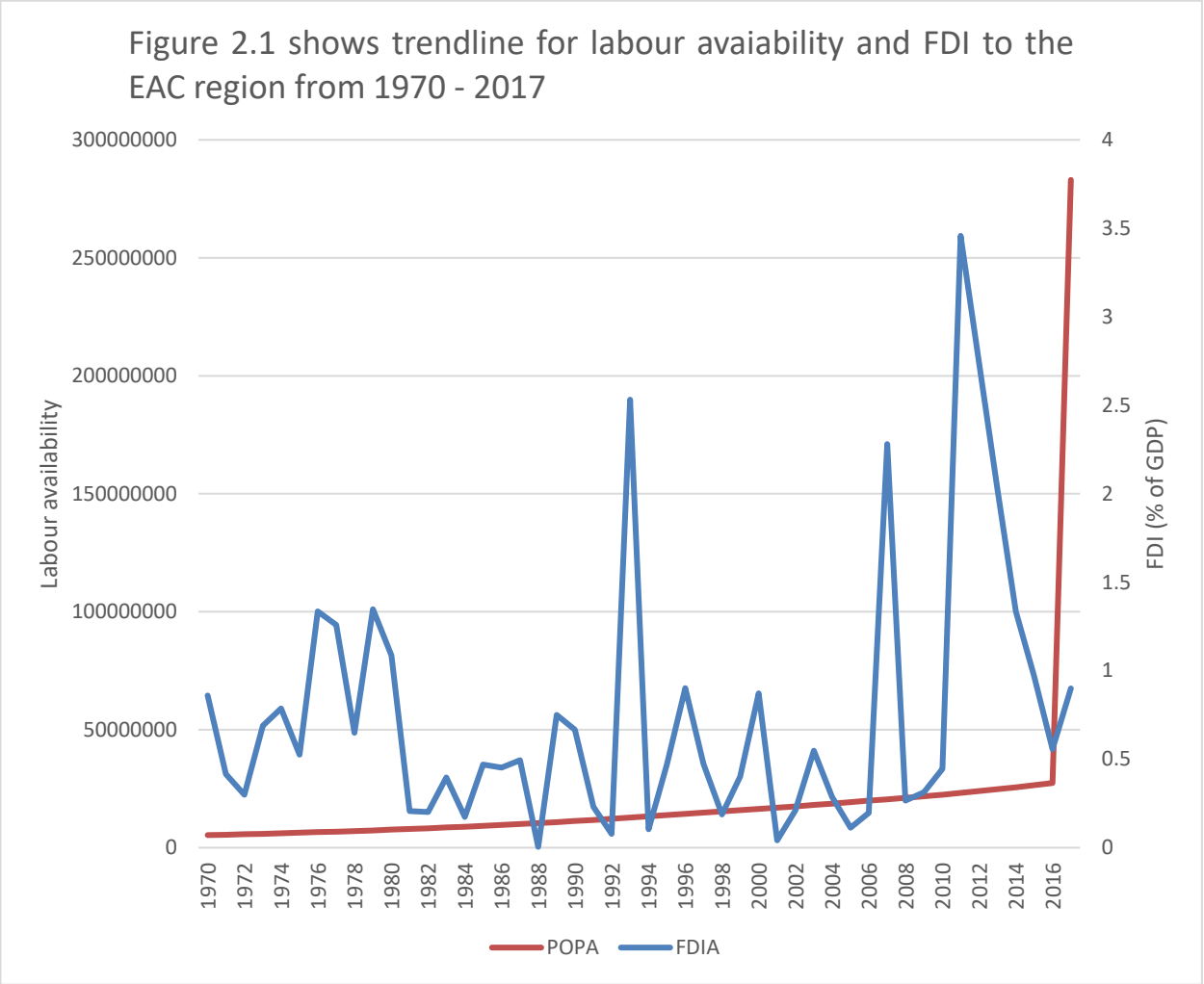
	Mean	Median	Maximum	Minimum	Std. Dev.	Observa tions
CIVIL LIBERTYT	5.1667	5.0000	7.0000	3.0000	1.1116	240
FDIA	2.4940	0.3828	320.1000	-0.7978	20.6446	240
FISCAL POLICY	14.6977	14.5670	31.5730	6.9716	3.9747	240
FMD	21.4103	20.8476	43.2472	7.2878	7.9334	240
GDP	8890000000.0000	4560000000.0000	74900000000.0000	220000000.0000	13300000000.0000	240
INFLATION	14.8237	8.3954	200.0260	-2.4059	24.6111	240
INFRASTURE	0.3355	0.2518	1.6510	0.0320	0.2814	240
HUMAN CAPITAL	85.3335	82.5349	148.1242	21.5813	31.3817	240
POPB	50.7585	50.7599	56.9000	46.9338	2.4591	240
POLITICAL RIGHT	5.5792	6.0000	7.0000	3.0000	1.1724	240
TRADE	41.9558	41.6440	74.5734	16.9511	12.3304	240
AID	35.6064	33.4510	120.1219	1.4576	23.2387	240
RESOURCE	10.3150	7.9005	44.6569	2.3586	7.1244	240

Source: Own computation using EViews 8 (x64)

After presenting our descriptive analysis seen in Table 2.2, we turn to the analysis of our variables. First, we started by presenting graphical analysis of trendlines in our key variables, in addition to examining the relationship between key variables based on scatter plots and trends. For example, the result seen in figure 2.1 indicate that over time the labour avaibaility trend is up ward slopinng, with a huge jumped in 2016. In the same period the foreign direct invetsment to the EAC region is volatile, reaching its peak in 1993, 2007 (a period when Burundi and Rwanda joined community) and 2011. In the year 2011, South Sudan gained her independence and announced her intention to join the EAC, and she joined the EAC in the year 2016. As a result, the potential increase in labour avialability might explained increased FDI investement to the region, particularly in 2011. Evidence from figure 2.1 trend suggest that although FDI fluatuates overtime, both, FDI and labour avaiability variable shows postive trend.

Considering FDI volatility, the variables might be suffering from structural breaks. We also introducted logarithsm to mimised effects of outliers in our study.

Figure 2.2 capture relationship between labour availability (proxy for efficiency seeking FDI) and FDI, we used scatter plots. The scatter plots contains linear trendline and displays equation and R-squared value on the chart. The vertical axis is our dependent variable (FDI) while horiztonal axis is our explanatory variable (labour avaibility).The evidence in Figure 2.2 shows that there is positive relationship between FDI and labour avaibility and thiat this relationship was much stronger around 1970s (when the amount of labour aviability was lower vis-à-vis 2017). In addition, the trendline is upward sloping but nearly flat, suggeting weak realtionship between FDI and labour avaibility. Moreover, this weak relationship is captured by R-squared values. In otherwords, R- quared reveals that, labours avaibility in the EAC region during the study period only explains 0.0.6% variation in the dependent. We conclude that labour avaibility has zero effect on FDI to the EAC region from 1970 to 2017. The result in Figure 2.1 and 2.2 is supported by our empirical evidence reported in Table 2.4, which shows that labour avaibility had zero short run effect on effciency seeking FDI.

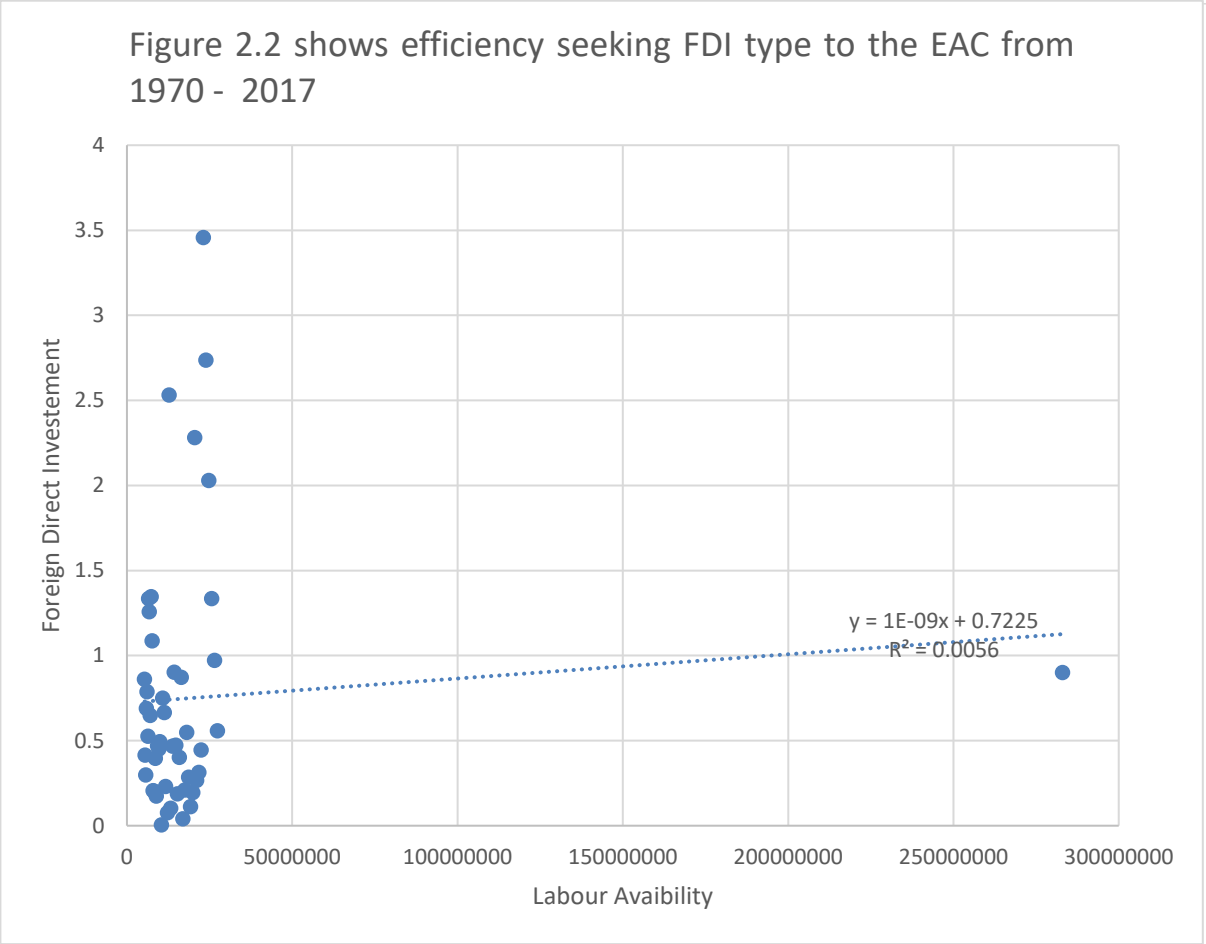


Source: Own computation using EViews 8 (x64)

Note:

FDIA – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

POPA – represent labour avaibility (measured as population ages 15-64, (total population between the ages 15 to 64) (total population)) of the EAC region from 1970 – 2017. Labour availability in this report is a proxy for efficiency seeking FDI.



Source: Own computation using EViews 8 (x64)

Note:

FDIA – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Labour Availability – represent labour avaibility (measured as population ages 15-64, (total population between the ages 15 to 64) (total population)) of the EAC region from 1970 – 2017. Labour availability in this report is a proxy for efficiency seeking FDI.

2.4.1 FDI determinants – Empirical results (Efficiency Seeking FDI)

Table 2.4 reports our empirical finding on efficiency-seeking FDI type In the East African community region from 1970 to 2017. We use labor force as a proxy for efficiency-seeking FDI.

Estimation technique involved in this study consist of Pool Ordinary list square (POLS) and Fixed Effect Model (FEM). Instrumental variable (see Table 2.3) was used to control for potential endogeneity in the model, thereby enabling us to obtain reliable estimates. All estimated models in this study, satisfies the requirements of diagnostic tests and residual analysis.

Table 2.4, model A and B are results from POLS and FEM. which consist of our full estimated model. The result shows that only financial sector development had significant short run deterrents on efficiency-seeking FDI type to the EAC region during the study.

All explanatory variables had zero effect on the efficiency-seeking FDI in the short run, with exception of financial sector development and humancapital. We calculated the error correction term by first estimating the original model and the obtained residuals from the estimated model were saved. We then applied in a regression of differenced variables as lagged error term.

However, based on Dike (2018) interpretation, Dike noted that, there is long run causality running from explanatory variables to dependent variable. According to Dike (2018) interepretation, we conclude based on the result of the statistically significant of error correction term (ECT) in our study, that all explanatory variables in the model had significant influence on efficiency-seeking FDI in the long run.

Take example of our full model A and B, we conclude that all variables had significant long run effect on dependent variable. This is because the speed of adjustment towards long run equilibrium is 0.9904 on and 1.1174 as seen in model A and B respectively. However, our R- squared which measure the explanatory power of our model is very low. That is, it indicates that the model on explains 26.0% to 39.3% variation in our dependent valuable variable is explained by the model A and B respectively.

Following statistical tests and diagonistic tests, we excluded some variables in the model to improve the performance of our model.

For instance, based on F statistical test, we drop market size, natural resource, government consumption, political right, and civil Liberty from the model. The idea was to improve the explanatory power of our model (which is the case as seen in Model 1-6 as seen in Table 2.4).

We reported our results based on POLS seen in model 1,2 and 3, in addition, results based on fixed effects estimated is reflected in model 4, 5 and 6. All tese estimated models 1-6 as seen in the

Table 2.4 Indicates that the performance of our model improved. See result of the R-squared an adjusted R-squared in table 2.4.

Although all our estimated models show that financial sector development and human capital has significant effect efficiency-seeking FDI in the short run, we based our interpretation on model 3 and model 6. This is because statistically, financial sector development and human capital coefficients has higher level of significance. Moreover, the R-squared and adjusted R-squared are higher, indicating that It is better model because of higher explanatory power.

In terms of statistical significance of explanatory variables on explained variable in the short run, our empirical estimates in table 2.4 indicates that all explanatory variables had zero short run effect on the efficiency seeking FDI type to the EAC region during the study period, with exception of financial sector development and human capital.

That is a unit reduction in the performance of the financial sector development discourage efficiency seeking FDI to the EAC region in the short run by arrange of 10.67 units to 10.48 units. Conversely, a unit improvement in the human capital attracts efficiency seeking FDI to the EAC region to a tune of 13.01units to 12.34 units in the short run.

According to Dike (2018) empirical results, our study also indicates that all explanatory variables in the model has significant influence on the efficiency-seeking FDI from 1970 to 2017. For instance, the study shows evidence of long run causality running from explanatory variables to the dependent variable based on the significance of our error correction term (ECT) coefficients reported in Table 2.4. Furthermore, our report on ECT seen in Table 2.4 shows that our ECT's coefficients has correct negative sign and highly significant. For example, information in Table 2.4, model 3 and model 6 shows that the speed of Adjustment towards long run equilibrium is 87.95% and 87.54% respectively.

With respect to our key variable, our empirical estimates suggest that the EAC region did receive efficiency-seeking FDI type during the study period. This is because cheap labor (efficiency-seeking FDI proxy) is statistically insignificant in the short run. In other word, cheap labour availability in the EAC region has zero short-run effect on foreign direct investment (FDI) measured as FDI net inflows (% GDP) to the EAC region. However, in the long run, The EAC region received efficiency-seeking FDI type during the study period.

We argue that the plausible explanation to the insignificance of labor force in the short run might be due to unproductive nature of labourforce in the EAC region in the short run. Therefore, unproductivity of these workers in the short run seems to raise the production costs curve for foreign investors. And yet according to Dunning's (1979) location theory, the primary motive for

efficiency-seeking FDI type is that such firms are motivated to locate their production facilities to countries with lower production costs (i.e., low wage productive employees). In other words, location theory suggests that countries with cheap labor costs in addition to highly productive workforce should attracts efficiency seeking FDI type. In our study, the EAC region attracts efficiency-seeking FDI type only in the long run.

Furthermore, this study shows that low wage labor force in the EAC region continue to have zero effect on efficiency-seeking FDI type in short run, even in the presence of trade liberalization and infrastructural development variables. We argued based on our empirical results that the efficiency-seeking FDI type were more concern with long term effect of production costs in the EAC region vis-à-vis short run. And because in the long run, the EAC region can introduce policy changes such as improving productivity of labour by augumenting raw labour. This can be achieved through education and training, we can see that in the run, the EAC region attracted efficiency-seeking FDI type.

Therefore, this study indicates, in long run, all explanatory variables had influence on the efficiency-seeking FDI. This could be that variables such as labor's productivity can be improved through training in the short run. Our study is consistent with Kang and Jiang (2012) empirical study.

Kang and Jiang (2012) provided a empirical results based on the location choice of Chinese multinational corporations (MNCs) in the East and South East Asia. They group their studies under market-seeking FDI, resources-seeking FDI and efficiency-seeking FDI. Under their efficiency-seeking FDI type (i.e., labour costs, a proxy for efficiency-seeking FDI) analysis. Kang and Jiang noted that FDI is attracted to countries with lower labour cost in the long run. Kang and Jiang empirical results is supported by Beugelsdijk et al. (2008) studies on FDI and growth relationship in the forty-four host countries from 1983 to 2003, where United States Multinational Enterprise (US MNE) are actively engaged. Beugelsdijk et al., shows that vertical FDI locates stages of their production facilities (i.e., unskilled-labour intensive stage of their production facilities) to countries with relatively abundant with unskilled labour. Beugelsdijk et al. (2008) further supported their argument by citing previous studies with similar empirical results (Braconier et al., 2005; Markusen, 1995)

Our empirical results, in addition to location theory as well as empirical studies on location based FDI determinants shows that, such firms locate stages of their production facilities to developing countries with low costs production. However, Anyanwu (2012) in the discussion of FDI determinants to African noted that FDI flows to these countries are attracted to improvement of human development. Anyanwu cited Reiter et al. (2010) studies and argued that African countries

should improve their labour productivity if they are to attract FDI. Anyanwu further reports, African countries with unproductive labour force deter efficiency-seeking FDI. Anyanwu (2012) used human capital as a proxy of efficiency-seeking FDI. Similarly, Nkoa (2018) found that thirty-five African countries did not benefit from foreign investment because of underdeveloped human capital. In other words, the low quality of labourforce in the thirty-five African countries deterred FDI during the study period.

Table 2.3 shows instrument specifications model for the efficiency seeking FDI to the EAC region for the study period 1970 – 2017. The model specification ranges from model A and model B and from model 1 to model 6 (see Table 2.4).

Module	Instruments
A	D(LFDIA(-1)) C D(LGDP(-2)) D(LRESOURCE) D(LPOPB(-1)) D(LINFLATION) D(LGOV(-1)) D(LTRADE) D(LFMD) D(LINFRAST(-1)) D(LHC(-1)) D(LPR) D(LCL) ECTG(-1)
B	D(LFDIA(-1)) C D(LGDP(-1)) D(LRESOURCE(-1)) D(LPOPB(-1)) D(LINFLATION) D(LGOV) D(LTRADE(-1)) D(LFMD) D(LINFRAST(-1)) D(LHC(-1)) D(LPR) D(LCL) ECTG(-1)
1	D(LFDIA(-1)) C D(LPOPB(-1)) D(LINFLATION(-1)) D(LTRADE) D(LFMD) D(LINFRAST(-1)) D(LHC(-1)) ECTB(-1)
2	D(LFDIA(-1)) C D(LPOPB(-1)) D(LINFLATION(-1)) D(POPB)*D(LTRADE) D(LFMD) D(LINFRAST(-1)) D(LHC(-1)) ECTB(-1)
3	D(LFDIA(-1)) C D(LPOPB) D(LINFLATION(-1)) D(LTRADE) D(POPB(-1))*D(LINFRAST(-1)) D(LFMD) D(LINFRAST(-1))D(LHC(-1)) ECTB(-1)
4	D(LFDIA(-1)) C D(LPOPB) D(LINFLATION(-1))D(LTRADE) D(POPB(-1))*D(LTRADE) D(LFMD) D(LINFRAST(-1))D(LHC(-1)) D(LCL(-1)) ECTB(-1)
5	D(LFDIA(-1)) C D(LPOPB) D(LINFLATION(-1))D(LTRADE) D(POPB(-1))*D(LTRADE) D(LFMD) D(LINFRAST(-1)) D(LHC(-1)) D(LCL(-1)) ECTB(-1)
6	D(LFDIA(-1)) C D(LPOPB) D(LINFLATION(-1)) D(LTRADE) D(POPB(-1))*D(LINFRAST) D(LFMD) D(LINFRAST(-1))D(LHC(-1)) ECTB(-1)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

Table 2.4 shows efficiency-seeking FDI type to the EAC region from 1970 – 2017. The dependent variable is FDI net inflows (% GDP).

Explanatory variables	**POLS-IV**	**FEM-IV**	**POLS-IV**			**FEM-IV**		
	A	B	1	2	3	4	5	6
C	1.1409	0.8218	-0.3845	-0.3755	-0.1974	-0.2834	-0.2586	-0.3027
	(0.4541)	(0.6000)	(0.4588)	(0.5073)	(0.6824)	(0.5756)	(0.6210)	(0.4957)
D(LGDP)	-17.9877	-13.7376						
	(0.3735)	(0.5314)						
D(LRESOURCE)	3.9711	3.2690						
	(0.6785)	(0.5828)						
D(LPOPB)	182.1502	213.5938	-88.4666	-87.4524	-28.9202	-35.5167	-29.6050	22.1004
	(0.3943)	(0.3214)	(0.5066)	(0.5678)	(0.8055)	(0.7474)	(0.8103)	(0.8195)
D(LINFLATION)	0.2869	0.3197	0.6496	0.6493	0.5926	0.3167	0.3141	0.3836
	(0.6784)	(0.5555)	(0.4910)	(0.4841)	(0.4608)	(0.7094)	(0.7073)	(0.6025)
D(LGOV)	-8.3668	-4.3528						
	(0.7465)	(0.4635)						
D(LTRADE)	3.0054	-4.7695	0.0568		-0.1345	-0.2584		-0.8410
	(0.5553)	(0.7466)	(0.9872)		(0.9659)	(0.9411)		(0.7708)
D(LFMD)	-12.9370**	-12.2906**	-11.3240***	-11.3387***	-10.7680***	-11.3332***	-11.1614***	-10.4789***
	(0.0186)	(0.0297)	(0.0065)	(0.0087)	(0.0025)	(0.0056)	(0.0079)	(0.0019)
D(LINFRAST)	-4.8466	-0.5619	-6.0518	-6.0338		-6.4108	-6.2280	
	(0.6326)	(0.9381)	(0.4841)	(0.4870)		(0.4277)	(0.4486)	
D(LHC)	9.4352	8.6125	14.6430*	14.3028	13.0139**	13.7104*	13.3033*	12.3429**
	(0.4813)	(0.3184)	(0.0645)	(0.1062)	(0.0466)	(0.0728)	(0.0785)	(0.0451)

D(LPR)	-1.0571	-0.4785						
	(0.9224)	(0.9342)						
D(LCL)	16.5119	10.5843						
	(0.6630)	(0.2557)						
D(POPB)*D(LTRADE)				0.2991			-1.3867	
				0.9797			0.9039	
D(POPB)*D(LINFRAST)					13.7177			0.4119
					0.5664			0.9813
ECT(-1)	-0.9904***	-1.1174***	-0.9085***	-0.9159***	-0.8795***	-0.9111***	-0.9053***	-0.8754***
	(0.0047)	(0.0050)	(0.0026)	(0.0026)	(0.0009)	(0.0023)	(0.0022)	(0.0006)
R-squared	0.2602	0.3934	0.3429	0.3485	0.5029	0.3566	0.3708	0.5531
Adjusted R-squared	-0.0568	0.1424	0.1991	0.2059	0.3942	0.2159	0.2332	0.4554
F-statistic	6.3563***	6.2784***	9.7815***	9.0226***	9.6474***	9.4289***	9.4366***	9.2624***
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
F-Critical value								
Instruments	14	14	9	9	10	11	11	10
Prob(J-statistic)	(0.4929)	(0.8378)	(0.6476)	(0.6610)	(0.7409)	(0.7573)	(0.7530)	(0.4618)
Durbin-Watson stat	2.0	2.0	1.8357	1.8399	1.7905	1.8362	1.8521	1.7841
Jargue-Bera	0.3117	1.8429	0.3709	0.4109	0.4643	0.4643	0.5460	1.5529
	(0.8557)	(0.3979)	(0.8307)	(0.8143)	(0.7928)	(0.7929)	(0.7928)	(0.4656)

No. Countries	5	5	5	5	5	5	5	5

Source: Own computation using EViews 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. Table 2. 4 indicates the long-run equilibrium and short-run dynamics of some the EAC region economic variables. As discussed, the error correction method (ECM) captures the speed of adjustment restores equilibrium in the dynamic model. In other word, the ECM should have a negative sign, and how quickly variables converge to equilibrium. Bannerjee et al. (1998) observes that a highly significant error correction term confirms presence of stable long-run relationship.

2.4.2 FDI Determinants – Empirical results (market-seeking FDI)

In this section, we empirically explored whether the East African Community region (EAC) received market-seeking FDI type from 1970 to 2017. The empirical estimates are based on POLS-IV and FEM-IV. Our empirical model seen in Table 2.6 is model report empirical results based on POLS and FEM. The POLS estimated models range from module 1 to module 3, while FEM ranges from model 4 to model 8. Our estimated modules satisfy statistical and diagonistics tests. We also corroborate the results by using interactive variables as seen in Table 2.6. We wanted to see whether signs and significance of the original estimates model estimated by POLS and FEM (i.e., model 1 and model 4). When the result is consistent with the original estimated model, then it reaffirms the original estimates. We then based our interpretation on model with highest R-squared and adjusted R-squared (which is model 2 and model 5) because it has higher explanatory power.

For instance, in our original model, our result from Model 1 and 4 shows underdeveloped financial sector had detrimental on the EAC regional economies. Poor financial sector development discourgage market-seeking FDI to the region. In other words, the result shows that when financial sector development variable decline by one unit, it significantly discourages FDI net inflows (% GDP) by 9.88 units in the short run. Based on Dike (2018) interpretation, we also conclude based on model 2 and model 5 that underdevelopment of the financial sector highly discourages market-seeking FDI type to the EAC region in the short run.

The plausible explanation to the negative effect could be that foreign investors might face difficulties in moving financial assets between hosts and home economy.

In addition, some foreign investors might want to raise an additional investment capital domestically to supplement their existing capital. In underdeveloped financial sector, raising such investment capital might pose a challenge to foreign invetsors. For example, financial sector might be under liquidated. Hence, foreign investors unable to acquire needed investment capital, and if they do raise some capital, the costs of capital might be relatively high due to imbalances between deman and supply (i.e., shortage of financial products).

Furthermore, most studies that looked at motives of FDI to Africa indicates that they are market seeking. In this context, our empirical result concurs with earlier findings that FDI to Africa is

market-seeking type. For instance, Kolstad and Wiig (2011) and Asiedu (2006) both found that market size played an essential role in attracting FDI to Africa. However, some empirical evidence suggests otherwise (Asiedu, 2002).

In terms of our result reported in Table 2.6, model 2 and model 5 further indicates, in the presence of human capital, market size significantly discourage market-seeking FDI to the EAC region during the study period both in the short run and long run period. This might be explained by the fact that EAC region citizens are poorly trained thereby, resulting into lower productivity and innovation, hence reducing market size of the EAC region.

Our empirical result on the effect of market size on market seeking foreign investors is empirically supported by Tasel and Bayarcelik (2013) study. Tasel and Bayarcelik reported that market size had zero effect on FDI in Turkey during the short run period vis-à-vis long run. In other words, according to Tasel and Bayarcelik, because coefficient for the EAC term is 38.4, negative and statistically significant, Tasel and Bayarcelik (2013) concluded that Turkey's market size played important role in attracting market significant FDI type in the long-run, since the economy was adjusting to restore 38.4% of the disequilibrium from the previous year to the current year. Moreover, they further said that low speed of adjustment is an indication that variables included in the study such as energy crisis, political instability and currency devaluation had a detrimental effect on FDI inflows in the long run.

Turning to the control variables, our control variables consist of inflation, general government consumption (Gov), trade, financial sector development (FMD), infrastructure (infrast), human capital (HC) and civil liberty (CL).

The estimates suggest that inflation, general government consumption, trade liberalization (trade) and infrastructure in themselves had zero effect on foreign direct investment (measured by FDI net inflows (%GDP)) to the EAC region from 1970 – 2017

Our empirical estimates based on original model indicate that financial sector had very high significant effect on FDI net inflows (%GDP). While human capital and civil liberty had modest influence on FDI net inflows (%GDP) to the EAC region from 1970 – 2017. However, result from FEM-IV (see model 4) shows that unit improvement in the civil liberty significantly attracts FDI net inflows (%GDP) by 8.80units in the short run. However, in long run, it would significantly attract foreign direct investment by 1.07 units. The results show that the long run effect on civil liberty on FDI net inflows (%GDP) is much greater vis-à-vis short run period.

In terms of financial sector development, results from POLS-IV is consistent to that of FEM-IV. That is, it shows that a unit reduction in the performance of the financial sector development deters FDI net inflows (%GDP) to the EAC region by 9.88 units in the short run, and highly significant – with long run causality running from financial sector development FDI being statistically significant.

We interacted market size with human capital, infrastructure, and financial sector development to determined combined effect of these variables on FDI. Also, to find out whether estimates from original models (model 1 and 4) remains the same (i.e., sensitivity analysis), in addition to our key model 2 and 5.

Table 2.6 result shows that, in the presence of infrastructure and financial sector development, market size variable has zero influence on FDI net inflows (%GDP) to the EAC region during the study period. In other words, in the presence of infrastructural development, financial sector development, the EAC region did not received market-seeking FDI type during the study period.

For instance, empirical evidence reported in model 2 (POLS-IV) and model 5 (FEM-IV) indicate that a unit increase in the market size in the presence of human capital significantly reduces market-seeking FDI type to the EAC region by a tune of 72.14 units and 74.32 units in the short run respectively.

However, in the long run there is evidence of long run causality running from market size in the presence of human capital to FDI.

Based on Tasel and Bayarcelik (2013) interpretation, our empirical results seen in Table 2.6 suggest that most variables had zero short run influence on foreign direct investment to the EAC during the study period. The zero short run effect can be attributed to weak policy changes by respective member countries. The adopted policy changes seem not to have any meaningful effect to foreign investors. For instance, changes in trade liberalization policy to promote trade as well as reforms in the financial sector development could not encourage FDI net inflows (%GDP) to the EAC region in the short run.

However, in the long run, according to Tasel and Bayarcelik (2013), our empirical results show that these variables do have influence on foreign direct investment to the EAC region. The argument in favor of long run effect of these variables on foreign investments is based on the concept that the coefficients of the error correction term which measured speed of adjustment

towards long run equilibrium is negative and highly significant.

According to North (1990) observation, countries with a quality institution that is stable and predictable witness increased private sector investment. The argument is that investors' property right is well protected, and potential trade disputes amongst economic agents are resolved through unbiased judiciary system. Therefore, countries with sound institutional quality are expected to attract more FDI. In the study, we adopted aid (however, aid is omitted from the model due model specification test and residual analysis) and civil liberty as a proxy for institutional quality. The idea of using aid as a proxy for institutional quality in this study is premised on the point that, Western aid to developing countries in general, and in specific to African economies is anchored on country's institutions quality (Anyanwu and Yameogo, 2015; Ehimare, 2011, Asiedu, 2006). Therefore, countries with low corruption, predictable and the robust rule of law, political stability and presence of active civil liberty attracts more foreign aid from Western donner countries. Studies by Naude and Krugell (2007) and Malgwi et al. (2006) all found that institutional quality positively explained FDI to Sub- Saharan African (SSA) economies. Conversely, some studies found that unpredictable and weak institutions did not deter FDI to the hosts economy (Ajide and Raheem, 2016; Astatike and Assefa, 2005; Asiedu, 2002). In Table 2.3, the study suggests that relatively strong institutional quality proxy by civil liberty as seen in model 4 positively encouraged FDI net inflows (%GDP) to the EAC region both in the short-run and long-run period during the study period.

In the context of macroeconomic stability and trade liberalization, review of empirical literature suggests that African economies with well managed macroeconomic policy result in stable inflation, which in turn motivates FDI. Moreover, countries that are open to trade are considered appealing to foreign investors. For instance, Okafor et al. (2015) and Olatungi and Shahid (2015) both found that sound macroeconomic management resulted in increased MNCs activity in the form of FDI to Africa.

However, our study indicates that inflation, which reflects macroeconomic management has no effect on FDI net inflows (%GDP) to the EAC region both in the short-run period. Implying that monetary policy adopted by respective EAC member countries did not result into significant improvement in the macroeconomic policies of these countries. The general argument in favour of stable and low inflation is that it does not reduce the assets base of foreign investors. Moreover, countries with higher inflation do have depreciated currencies. The weak currency makes it expensive to import capital goods into the country. In terms of

trade liberalization, Asiedu and Lien (2011) found that trade liberalization benefited developing countries in the form of increase FDI participation into the developing economies.

Kandiero and Chitiga (2006) and Asiedu (2002) echoed a similar result that trade liberalization encourages FDI African economies. Mijiyawa (2014) also expose the importance of trade openness to Ghana. Mijiyawa noted that Ghana benefited from global FDI because of its trade liberalization. It is thereby indicating that Ghana is ready to trade with the rest of the world.

In our empirical exercise, the result suggests that trade liberalization has zero effect on FDI net inflows (%GDP) to the EAC region both in the short-run and long-run period. Similarly, findings were captured in Vinesh et al. (2014). Vinesh et al. (2014) recent studies indicate that trade liberalization in the South African development community (SADC) negatively affect FDI inflow to the region from 1985 to 2010.

Moreover, studies by Yasin (2005), Naude and Krugell (2007) and Asiedu (2002) looked at the effect of government expenditure on economic growth supports the notion that it encourages country's growth. However, we argued that too much government expenditure might crowd-out private sectors investment. Thereby, discouraging FDI to the host country. Furthermore, although donor funds partly fund the national budget for developing countries, a large part of the sovereign country's budget is tax-financed. In this context, large government consumption might be a recipe for higher tax. So, this might discourage FDI. For instance, developing countries usually debt-financed its infrastructure. Therefore, too much borrowing might signal to foreign investors that the economy is struggling, and the likelihood of resorting to higher tax to pay back the loan (i.e. foreign debt) is much higher. Therefore, significant government expenditure could discourage FDI (Awan et al., 2014; Bende- Nabende, 2002; Schoeman et al., 2000). In our study, our empirical estimates show that government expenditure has zero effect on FDI net inflows (%GDP) to the EAC region. From a policy perspective, it seems that changes in the government expenditure which seems popular for market-seeking FDI, as the market-seeking FDI primary motive is to serve the domestic market was not significant enough to influence foreign investors to invest in the EAC region during the study period. Although we argue that in the case of the EAC region, government expenditure tends to provide the needed market for their goods – something that might be appealing to market seeking FDI.

With respective to human capital, most studies have found human capital to be positively related to FDI for the African economies (Sannassee et al. 2014; Vinesh et al. 2014; Suliman

and Mollick, 2009, Yohanna 2013). Moreover, Cleeve et al. (2015) studies robustly examined the effect of human capital on FDI for the thirty-five African countries found all measurement of human capital (i.e., secondary and tertiary enrolment, and literacy rate) to have played a critical role in attracting FDI to Africa. However, the result of our study is mixed. However, the result from the fixed effect model reported in model 4 supports previous studies (Sannassee et al. 2014; Vinesh et al. 2014; Suliman and Mollick, 2009, Yohanna 2013) that countries with well improved human capital benefits from foreign direct investments. In our study, we found that a unit improvement in the human capital would barely results into a8.37 units of FDI net inflows (%GDP) to the EAC region in the short run. Conversely, in the long-run period human capital seems to have significant positive effect on foreign investors as seen in the coefficients of the error correction term. However, surprisingly, human capital when interacted with market size, it turns out that the short run estimated coefficient is statistically significant and has negative value (-74.32) as seen in model 5. What our result suggest is that the EAC market size in the presence of poorly endowed human capital significant deter market seeking FDI to the region. This makes sense as the productivity of unskilled labor low vis-à-vis well trained and skilled labor force.

In context to earlier studies, they noted that African countries with well-developed human capital tend to attract FDI (Sannassee et al. 2014; Vinesh et al. 2014).

In terms of the effect of a political factor on FDI to African, studies by Njoroge et al. (2015); Awan et al. (2014) and Bartels et al. (2009) all found that political stability is crucial in attracting FDI to African. Moreover, Udo and Egwaikhide (2008) found that the political instability in Nigeria since 1970 – 2005 have significantly reduced FDI to Nigeria during the study period. The idea is that political instability destroys properties, in the form of public demonstration or even war (Drogendijk and Blomkvist, 2013). Yain, in the year 2005 found both the political right and civil liberty of which are both measurements of political risk to have reduced FDI to eleven SSA countries from 1990-2003.

However, civil liberty turned out to be postively related to FDI net inflows (%GDP) to the EAC region both in the short-run and long-run period. The significantly positive sign of civil liberty seen in model 4 suggests that the EAC region managed to established laws for the good of the community (specifically, with relation to freedom of association and speech). This indicates that citizens can hold their elected official account.

In terms of financial sector development, Anyanwu (2011) noted that the development of

financial sector measures country's developmental stage. For instance, the UK, highly developed country has a well-developed financial sector with various financial instruments. Moreover, well developed financial sectors allow free movement of capital amongst countries. It also facilitates payment between debtors and creditors. It is in this context that most empirical studies have found financial sector development to have a positive effect on FDI. The positive relationship between financial sector development and FDI suggest countries seeking to attract FDI should adopt policies that results to development of financial sectors.

For example, recent studies by Mugableh (2015) and Kinuthia and Murshed (2015) found the country's financial sector development to be positively related to FDI. Furthermore, Flora and Agrawal (2014) conducted an extensive empirical review of the determinants of FDI to the developing countries. Flora and Agrawal's analysis involves studying empirical evidence for the last ten to twenty years. They concluded that financial sector development positively influences FDI to the host countries.

Conversely, Nkoa (2018) found that financial sector measured by broad money has a negative impact. According to Nkoa, broad money describes the liquidity of an asset that is convertible for cash. However, in terms of domestic credit provided to private sectors by banks, Nkoa found it to have a positive effect on FDI to the thirty-five African economies. The presence of broad money supply in the host economy like African economies suggests that, foreign investors can partly raise their needed investment capital locally (i.e., Africa). Therefore, the availability of cheap capital seems to have attracted FDI to African economies as cited by Nkoa. Moreover, Nkoa also found that cheap interest rate on loans attracted FDI to the African economies during the study period of 1995 – 2015.

Among control variables, Table 2.3 shows that financial sector development is the most critical control variable based on size and significance of estimated coefficient. In the short-run and long-run, financial sector development has discouraged FDI net inflows (%GDP) to the EAC region from 1970 – 2017. However, our study contrasts earlier findings. For instance, Mugableh (2015) used the same measurement for financial sector development and found financial sector development to have a positive effect on FDI in Malaysia.

Moreover, our finding also suggests that foreign investors are more concern with both short term and the long-term development of the financial sector in the EAC region during the study period. We argue that this is the particularly the case for those investors that have an intention to undertake economic activities in the EAC region by raising investment capital domestically.

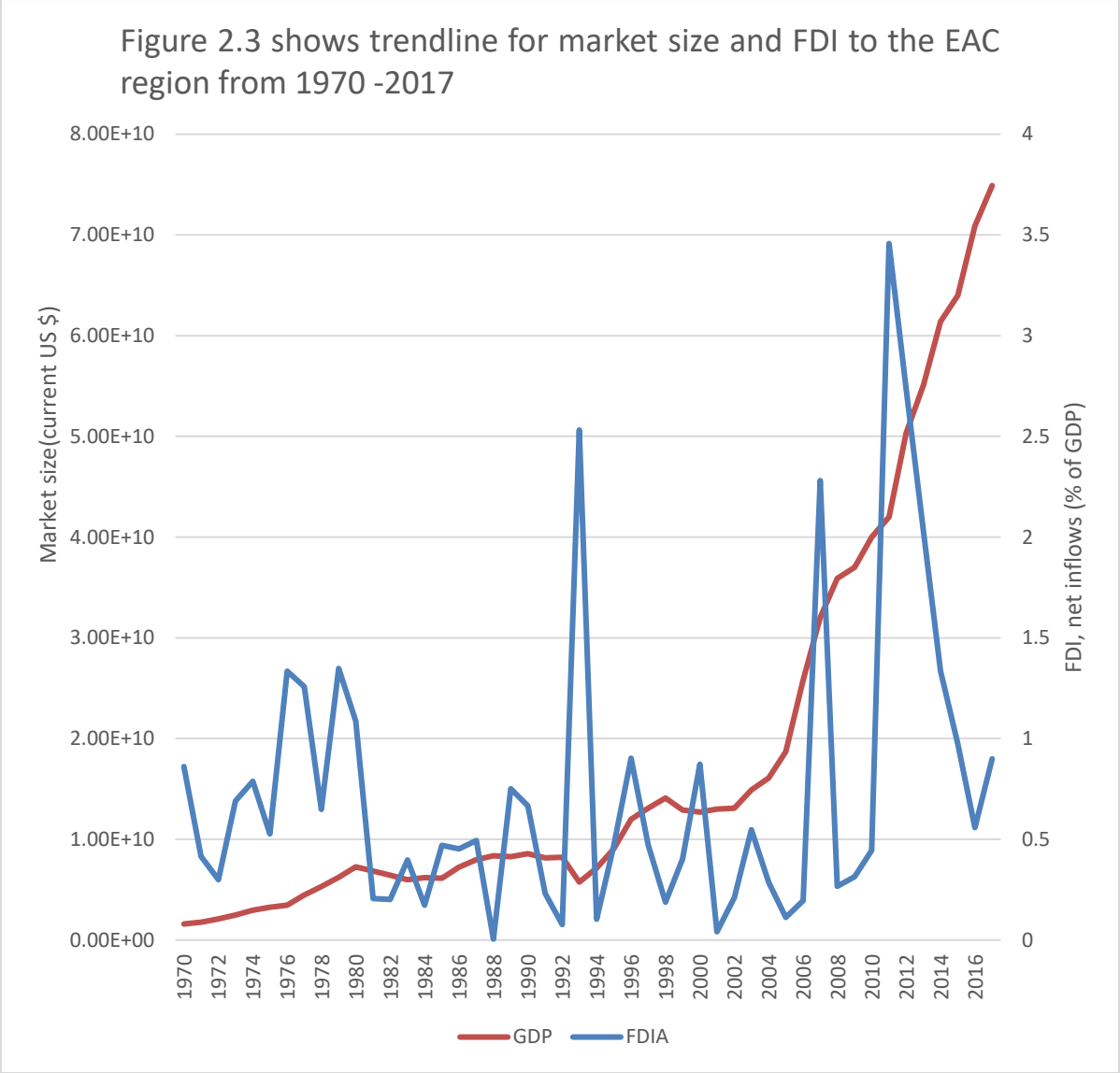
We argue that poorly developed financial sectors mean less saving, and this translates to higher cost of capital. In addition, underdeveloped financial sectors might also impede cross border capital movements.

In terms of infrastructure, Sannassee et al. (2014) found that a well-developed infrastructure partly influenced the South African Development Community (SADC) to attract FDI. Sannassee et al., empirical evidence indicates that SADC attracted FDI both in the short-run and long-run period because of well-developed infrastructure. We also found similar results. However, our study only suggests that the long-term effect of infrastructural development in the EAC region is statistically significant. The importance of well-developed infrastructure to foreign investors is not a surprise. The excellent infrastructure reduces costs of transacting business. Moreover, we also note that the infrastructure for the SADC region is far well-developed compared with those of the EAC region. Most studies that have explored the infrastructure development and FDI nexus have found a positive association (Wekesa et a. 2017; Okafor et al. 2015; Mijiyawa 2014; Onyeiwu and Shrestha, 2004).

Therefore, after finishing the empirical literature review, we conducted analysis of our variables by presenting graphical analysis of trends in our key variables, in addition to examining the relationship between key variables based on scatter plots and trends. For example, the result seen in figure 2.3 report trendline for FDI and mark size during the study period. Here, we wanted to see if there was relationship between FDI and market size by visually looking at the trend line overtime. Result from figure 2.3 shows that from 1970-2017, FDI to the EAC region has been volatile. In the same year GDP (proxy for market size) is less volatile. What both FDI and GDP variables has in common is that their trendline shows upward movement during the study period. However, in 1994, the region witnessed political upheaval, culminating to Rwanda genocide. We can see sudden dip in FDI variables, indicating that FDI is sensitive to country's political stability. Overall, the trend shows that mark size continues to grow steadily and pick-up pace around 2007 when Rwanda and Burundi join the join and signed common market and custom union. A similar trend is observed when South Sudan stated, in the year 2011 that it will join the EAC.

Figure 2.4 is our scatter plots, showing the relationship between FDI and market size. Vertical axis and horizontal axis reflect our depend variable (FDI) and independent variable (market size) respectively. The scatter suggests that relationship between these two variables were much stronger in the earlier study period. In addition, the trendline shows upward sloping –

indicating positive association between FDI and market size. With respective to R-squared value of just 0.1225 values. It states that market size only explains 1.2% variation in FDI to the EAC region. However, R-squared reported in Figure 2.4 is greater than that reported in Figure 2.2. Therefore, it is not surprisingly that our empirical evidence seen in Table 2.6, model 5 shows that the EAC region significantly attracted marketing seeking FDI both in short run and long run period during the study period.

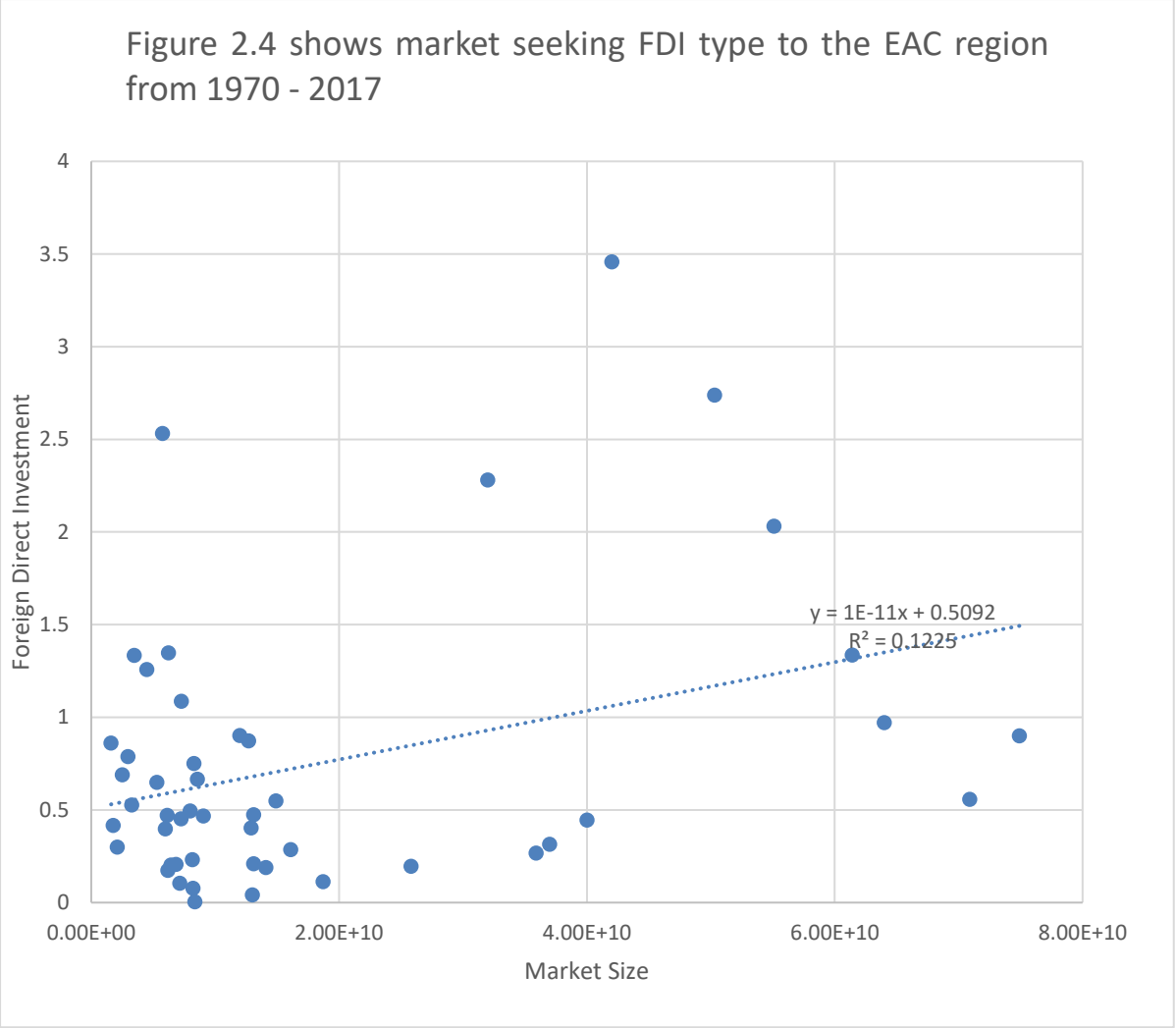


Source: Own computation using EViews 8 (x64)

Note:

FDIA – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

GDP – represent market size (measured as GDP (current US$)) of the EAC region from 1970 – 2017.



Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Market Size – represent market size (measured as GDP (current US$)) of the EAC region from 1970 – 2017.

Table 2.5 shows instrument specification model for the market-seeking FDI to the EAC region effect for the study period ranging from 1970 – 2017. The model specification ranges from model 1 to model 8 (see Table 2.6).

Model	Instruments
1	D(LFDIA(-1)) C D(LGDP) D(LINFLATION) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
2	D(LFDIA(-1)) C D(LGDP(-1)) D(LGDP)*D(LHC)D(LINFLATION) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
3	D(LFDIA(-1)) C D(LGDP(-1)) D(LGDP)*D(LINFRAST) D(LINFLATION) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
4	D(LFDIA(-1)) C D(LGDP) D(LINFLATION) D(LGOV)D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
5	D(LFDIA(-1)) C D(LGDP) D(LINFLATION) D(LGDP)*D(LHC) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
6	D(LFDIA(-1)) C D(LGDP(-1)) D(LGDP)*D(LFMD)D(LINFLATION(-1)) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST)D(LHC(-1)) D(LCL) ECTD(-1)
7	D(LFDIA(-1)) C D(LGDP(-1)) D(LGDP)*D(LINFRAST) D(LINFLATION) D(LGOV) D(LTRADE) D(LFMD)D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)
8	D(LFDIA(-1)) C D(LGDP(-1)) D(LGDP)*D(LFMD)D(LINFLATION) D(LGOV) D(LTRADE) D(LFMD) D(LINFRAST) D(LHC(-1)) D(LCL) ECTD(-1)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

Table 2.6 shows market-seeking FDI to the EAC region from 1970 – 2017. The dependent variable is FDI net inflows (% GDP).

Explanatory variables	POLS-IV	POLS-IV	POLS-IV	FEM-IV	FEM-IV	FEM-IV	FEM-IV	FEM-IV
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
C	-0.6083	-0.3926	-0.3743	-0.6083	-0.5483	-0.1692	-0.3743	-0.1534
	(0.1358)	(0.5263)	(0.5748)	(0.1358)	(0.1436)	(0.8302)	(0.5748)	(0.8316)
D(LGDP)	5.1200	3.6244	1.1506	5.1200	6.4053**	-2.5617	1.1506	-2.7524
	(0.1396)	(0.6749)	(0.8962)	(0.1396)	(0.0518)	(0.7984)	(0.8962)	(0.7682)
D(LINFLATION)	0.4407	0.3253	0.4394	0.4407	0.3211	0.3531	0.4394	0.4368
	(0.1719)	(0.2833)	(0.1953)	(0.1719)	(0.2802)	(0.6033)	(0.1953)	(0.2300)
D(LGOV)	-1.4190	-0.7002	-1.7878	-1.4190	-0.4274	-2.0382	-1.7878	-2.1656
	(0.5393)	(0.7672)	(0.5179)	(0.5393)	(0.8436)	(0.4709)	(0.5179)	(0.4216)
D(LTRADE)	-0.6993	-1.2942	-0.0216	-0.6993	-1.7653	0.7081	-0.0216	0.7945
	(0.7656)	(0.6494)	(0.9942)	(0.7656)	(0.4315)	(0.8366)	(0.9942)	(0.7963)
D(LFMD)	-9.8783***	-9.5218***	-10.6444***	-9.8783***	-8.9699***	-11.3363***	-10.6444***	-11.0347***
	(0.0006)	(0.0025)	(0.0047)	(0.0006)	(0.0008)	(0.0083)	(0.0047)	(0.0068)
D(LINFRAST)	1.9822	1.0218	1.5386	1.9822	1.3028	1.2326	1.5386	1.2087
	(0.3565)	(0.6336)	(0.5849)	(0.3565)	(0.5156)	(0.6503)	(0.5849)	(0.6337)
D(LHC)	8.3702*	10.1807**	9.1541*	8.3702*	9.5579**	11.1330**	9.1541*	9.5070*
	(0.0816)	(0.0272)	(0.0852)	(0.0816)	(0.0361)	(0.0480)	(0.0852)	(0.0784)
D(LCL)	8.8023*	7.0544	8.7594	8.8023**	7.0530	8.9393	8.7594	8.9193
	(0.0662)	(0.1189)	(0.1035)	(0.0662)	(0.1122)	(0.1396)	(0.1035)	(0.1187)
D(LGDP)*D(LHC)		-72.1423**			-74.3236**			
		(0.0247)	(0.8338)		(0.0138)			

D(LGDP)*D(LINFRAST)			0.9831			-5.4071	0.8338	
D(LGDP)*D(LFMD)						(0.8834)	(0.9831)	-5.7132
								(0.8695)
ECTC(-1)	-1.0678***	-0.9404***	-1.0322***	-1.0678***	-0.9633***	-0.9499***	-1.0322***	-1.0134***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.7140	0.7543	0.6963	0.7140	0.7636	0.6336	0.6963	0.6573
Adjusted R-squared	0.6335	0.6750	0.5983	0.6335	0.6873	0.5073	0.5983	0.5467
F-statistic	10.0040***	9.7587***	8.2718***	10.0040***	10.7884***	7.9927***	8.2718***	8.3274***
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Instruments	11	12	12	11	12	12	12	12
Prob(J-statistic)	(0.0510)	(0.1140)	(0.0819)	(0.0510)	(0.1669)	(0.0770)	(0.0819)	(0.1229)
Durbin-Watson stat	1.8310	2.0034	1.7813	1.8310	2.0715	1.7287	1.7813	1.7544
Jargue-Bera	3.3444	1.7978	2.1827	2.3560	2.2251	0.4513	2.1827	0.6806
	(0.1878)	(0.4070)	(0.3358)	(0.2358)	(0.3287)	(0.7980)	(0.3380)	(0.7116)
No. Countries	5	5	5	5	5		5	5

Source: Own computation using EViews 8 (x64). Note: *******, ****** and ***** denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. Table 2. 6 indicates the long-run equilibrium and short-run dynamics

of some the EAC region economic variables. As discussed, the error correction method (ECM) captures the speed of adjustment restores equilibrium in the dynamic model. In other word, the ECM should have a negative sign, and how quickly variables converge to equilibrium. Bannerjee et al. (1998) observes that a highly significant error correction term confirms presence of stable long-run relationship.

2.4.3 FDI Determinants – Empirical results (Natural Resource-Seeking FDI)

In section 2.4.3, we present our empirical result is on the resource-seeking FDI type to the East African Community region (EAC) from 1970-2017. Two estimation techniques were involved as seen in Table 2.8. The first four models (i.e., model 1-4) present estimated models based on pool ordinary least square (POLS). Model 5-8 are estimates based on fixed effect model (FEM). We utilized instruments variables (see Table 2.7) to control for potential endogenity in the model. The estimated models satistifies specification tests such as residual analysis. We looked at whether the EAC region attracted Resource-seeking FDI type both in short run and long run period during the study period.

According to location theory, we assume that natural resource availability should have a positive effect on Resoirce-seeking FDI type. However, the empirical evidence on the effect of natural resources on FDI is mixed. Although broadly speaking, most empirical studies that looked at the influence of natural resource on FDI in the African economies have found positive natural resource-FDI nexus.

For instance, Anyanwu and Yameogo (2015) reported that natural resource is the key driver of FDI to the Economic Corporation for the West African States (ECOWAS) region. Anyanwu and Yameogo concluded that, during the study period, African economies receives resource seeking FDI type as foreign investors were attracted to natural resources. Anyanwu and Yameogo (2015) findings are supported by previous results, which suggest that African countries have benefited from FDI because of the abundance of it its natural resources (Anyanwu, 2011; Asiedu, 2006; Onyeiwu and Shrestha, 2004; Asiedu, 2002). Conversly, Asiedu and Lien (2011) studies on the effect of natural resource on FDI shows that natural resources (proxy by crude oil and mineral) were negatively associated with FDI. That natural resource availability in Africa discourages FDI to the countries under study.

In our study, based on results in Table 2.8, our empirical findings indicate that natural resource availability in the EAC region had zero influence on the foreign direct investment during the study period.

Our original model is model1 (POLS-IV estimates) and model 5 (FEM-IV estimates). The rest of the estimated models test the robustness of the original estimates. We introduced interacted FDI variable with infrastructure, political right, and human capital. This enables us to capture the influence on natural resource on FDI in the presence of infrastructural development, poliical

stability and human capital.

Our discussion is centered on our original model (1 and 5) and sensitivity analysis based on model (3 and 7). We selected model 3 and model 7 because they have greater R-squared and adjusted R-squared.

As stated above, our empirical results show that natural resources alone have zero effect on FDI (measured as FDI net inflows (%GDP)) to the EAC region from 1970 – 2017. However, based on Table 2.8, model 7 results, we conclude that natural resource variable in the presence of political right significantly attracts FDI net inflows (%GDP) to the EAC region from 1970 – 2017. For instance, the result show that a unit increase in the resource availability in the presence of political stability significantly attracts resource seeking FDI to the EAC region from 1970 – 2017 by 46.68 units in the short-run. While in the long run it significantly attracts resource seeking FDI by 1.04 units. This is because there is presence of causality running from natural resource variable to FDI.

Furthermore, based on magnitude of estimated coefficient as seen in Table 2.8, model 7, we argued that foreign investors were more attracted to the short-run presence of natural resources in the presence of political stability, visa-vis long-run (coefficients of ECT is lower).

We also observed that resource availability in the presence of infrastructure and human capital has zero short run effect on FDI net inflows (%GDP) to the EAC region from 1970 – 2017. we argued that this could be due to limited government investments in infrastructure and education of workforce in the EAC region. However, based on significance of error correction term, our studies indicate that foreign investors were more attracted to the natural resource availability in the presence of political stability in long run visa-vis short-run. In other words, resource availability in the presence of political right played a critical role in attracting resource seeking FDI to the EAC region during the study period. We further states that, there is presence of causality running from natural resource in the presence of human capital and infrastructure to FDI varible.

Furthermore, inflation, human capital and civil liberty barely had any short run influence on FDI as seen in model 7. With regards to financial sector development, the result is consistent to those reported in Table 2.6 both in terms of significance and signs of estimated coefficients.

In our study, we found that political stability proxy by political right had zero short run effect on FDI during the study period. The plausible explanation to the zero short run of political right on FDI varible could be due to the fact that, even though the EAC region allows for formation of new political parties, freedom of political participation by various political parties both at presidential and parliamentary election (suggesting the EAC member countries are democratic countries). It seems that voters' suppression, intermidation of opposition parties and arrest of opposition party

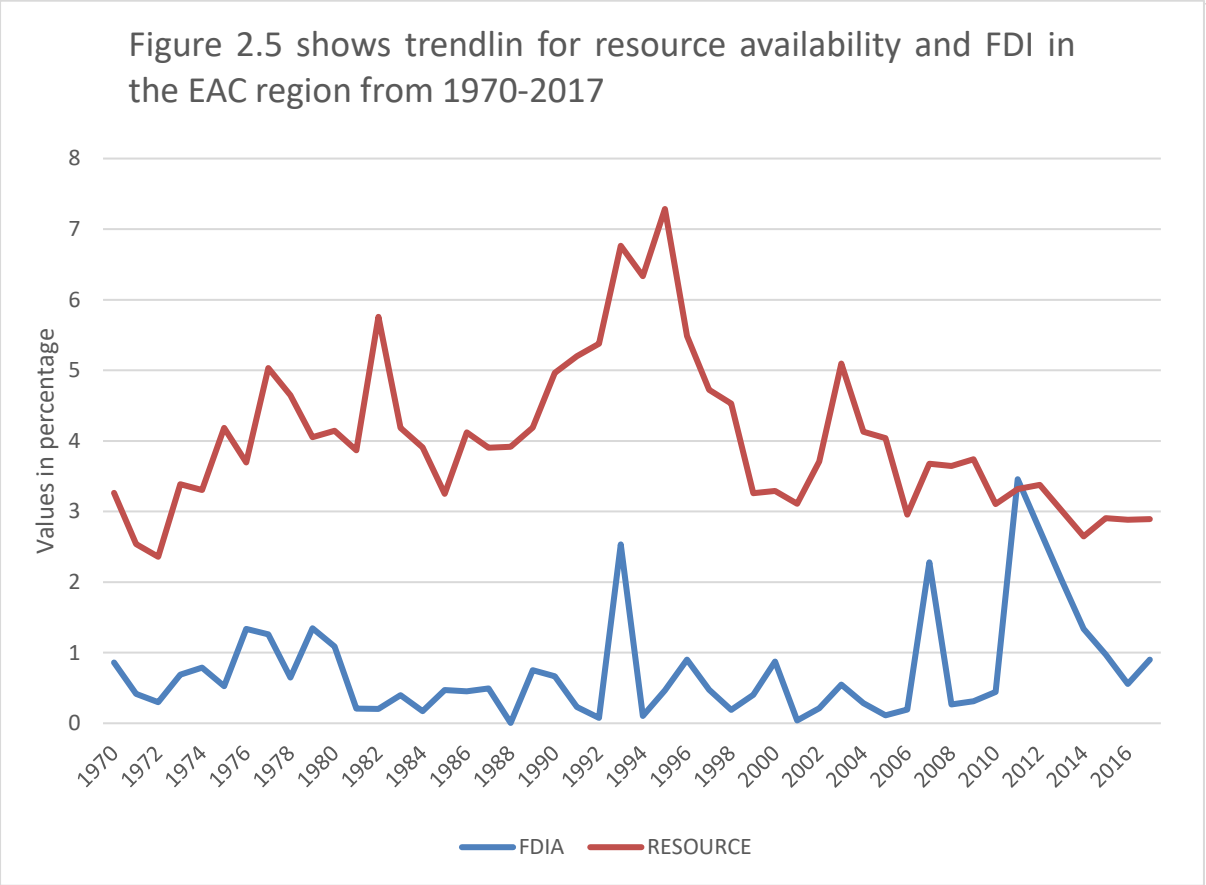
leaders by incumbent party leader (i.e., president) undermines the attractiveness of political right (proxy of political stability) to foreign investors during the study period.

According to Dike (2008), we conclude that all independent variables included in the study had influence on the FDI in the long run during the study period. Since there is presence of causality running from explanatory variables to dependent variable (see coefficients of ECT).

However, we first started by presenting graphical analysis of trends in our key variables, in addition to examining the relationship between key variables based on scatter plots and trends. The result seen in figure 2.3 is trendline graph showing trend in FDI and natural resource availability over time. The vertical axis are values in percentages. This is because both FDI and natural resources variables are a both measured as a percent of GDP. Evidence from Figure 2.3 indicate that from 1970 – 2017, both FDI and natural resource availability share main characteristics. They are both volatile and as well as following similar rend line. We argued that there is possibility of weak relationship between FDI and natural resources availability based on the trend line. Also, just like FDI variable, natural resources might be suffering from structural breaks. For instance, in 1995, natural resources in the EAC region registered a spike before a sharp decline in the subsequent years.

Figure 2.4 consist of scatter plots used to capture relationship between the two variables (i.e., FDI and natural resources). The explained variable is on the vertical axis while explained regressor is on the horizontal axis. The graph contains linear trendline – displaying equation and R-squared values on chart, this enables us to better understand the nature of relationship between the two variables.

Result in Figure 2.4 based on downward slope trend line indicate presence of weak and negative relationship between natural resource availability and FDI during the study period. We can see that the coefficient of the regressor has negative sign (i.e., -0.047). And the weakness is more pronounced during the later stage of the study period. Moreover, R-squared value shows that natural resource availability explains 0.05% variance of FDI inflows to the EAC region during the study period. Based on results from Figure 2.3 and 2.4, we conclude that natural resources effect on FDI. Besides, our empirical evidence reported in Table 2.8 shows that natural resource availability had zero effect on FDI, however, in the presence of political stability, the EAC region managed to receive resource seeking FDI both in short-run and long-run period.

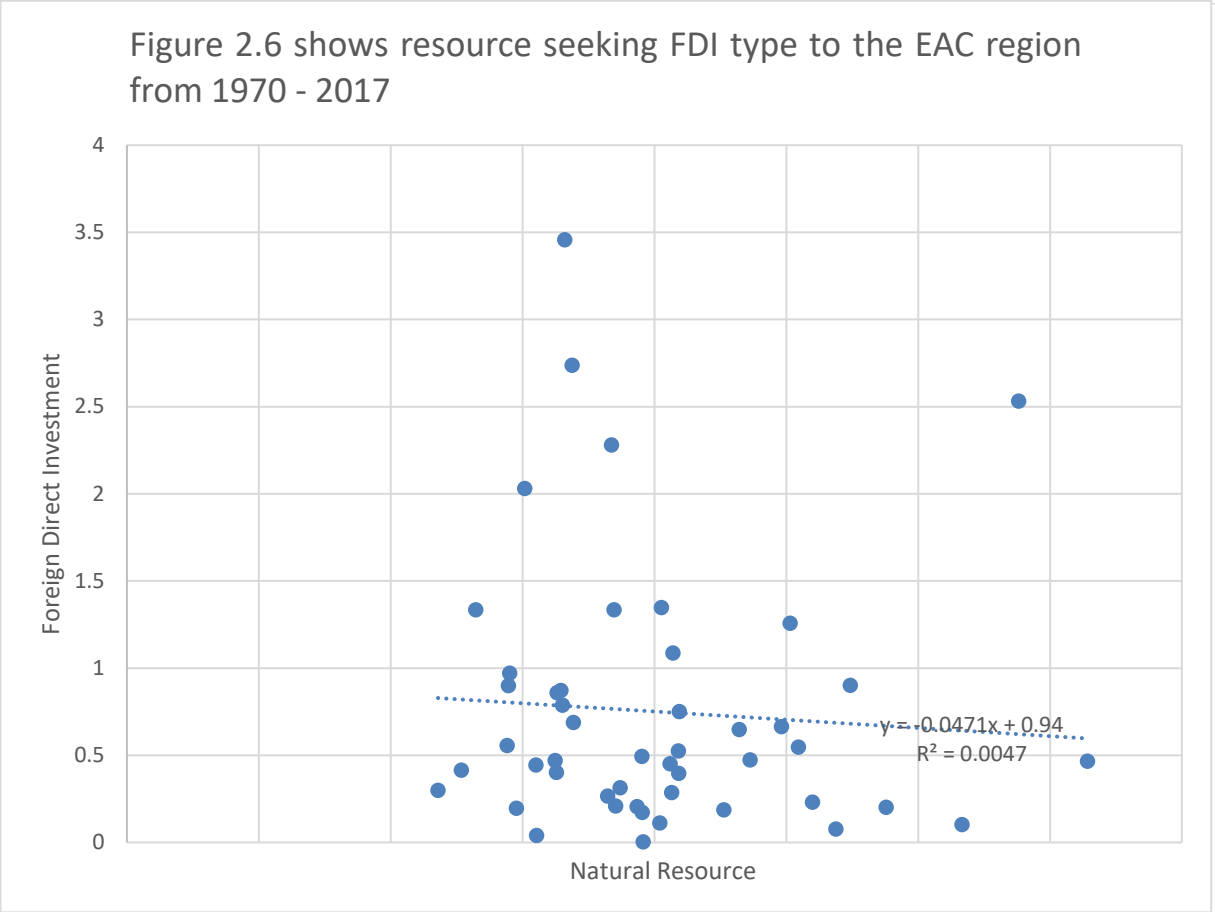


Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Natural Resource – represent total natural rent (measured total natural resources rents (% of GDP)) of the EAC region from 1970 – 2017.



Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Natural Resource – represent total natural rent (measured total natural resources rents (% of GDP)) of the EAC region from 1970 – 2017.

Table 2.7 shows instrument specification model for the resource-seeking FDI to the EAC region for the study period ranging from 1970 – 2017. The model specification ranges from model 1 to model 8 (see Table 2.8).

Model	Instruments
1	D(LFDIA(-1)) C D(LRESOURCE(-1)) D(LINFLATION) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR) D(LCL) ECTC(-1)
2	D(LFDIA(-1)) C D(LRESOURCE(-1))D(LINFLATION) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR)D(LCL) ECTC(-1)
3	D(LFDIA(-1)) C D(LRESOURCE)*D(LPR) D(LINFLATION) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR(-1)) D(LCL(-1)) ECTC(-1)
4	D(LFDIA(-1)) C D(LINFLATION) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR) ECTC(-1)
5	D(LFDIA(-1)) C D(LRESOURCE(-1))D(LINFLATION(-2)) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR)D(LCL) ECTC(-1)
6	D(LFDIA(-1)) C D(LRESOURCE(-1))D(LINFLATION(-2)) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR) D(LCL) ECTC(-1)
7	D(LFDIA(-1)) C D(LRESOURCE)*D(LPR)D(LINFLATION) D(LGOV) D(LFMD) D(LINFRAST) D(LHC) D(LPR(-1))D(LCL) ECTC(-1)
8	D(LFDIB(-1)) C D(LRESOURCE)*D(LHC(-1))D(LINFLATION(-1)) D(LGOV) D(LFMD) D(LINFRAST(-1)) D(LHC(-1))D(LPR(-1)) D(LCL(-1)) ECTC(-1)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

Table 2.8 shows resource-seeking FDI to the EAC region from 1970 – 2017. The dependent variable is FDI net inflows (% GDP).

Explanatory variables	POLS-IV	POLS-IV	POLS-IV	POLS-IV	FEM-IV	FEM-IV	FEM-IV	FEM-IV
	Model 1	Model 2	Model 3	4	Model 5	Model 6	Model 7	Model 8
C	-0.2304	-0.1757	-0.3775	-0.1373	0.1311	0.2265	-0.4198	-0.5019
	(0.5225)	(0.6463)	(0.2969)	(0.7351)	(0.7987)	(0.6766)	(0.2643)	(0.3180)
D(LRESOURCE)	3.7985	4.5220			-3.2222	-2.8629		
	(0.4557)	(0.3825)			(0.5421)	(0.5887)		
D(LINFLATION)	0.3395	0.3403	0.6642	0.5606	-1.0027	-1.0610	0.7356*	0.4950
	(0.3187)	(0.3341)	(0.0979)	(0.1935)	(0.3132)	(0.2810)	(0.0704)	(0.6165)
D(LGOV)	-4.4497	-4.5888	-0.4397	2.6607	0.5148	0.3571	-0.6242	4.9962
	(0.3214)	(0.3212)	(0.8318)	(0.5686)	(0.9251)	(0.9488)	(0.7733)	(0.1806)
D(LFMD)	-9.3131***	-9.5469***	-8.8663***	-10.7563***	-13.0406***	-13.5160***	-8.6397***	-14.6312***
	(0.0081)	(0.0089)	(0.0021)	(0.0056)	(0.0055)	(0.0054)	(0.0040)	(0.0040)
D(LINFRAST)	1.5910		2.7783	3.0877	1.3283		3.0321	-7.1636
	(0.4821)		(0.2382)	(0.3185)	(0.6703)		(0.2167)	(0.3562)
D(LHC)	7.7306	8.4897	6.7245*	-0.2239	-0.8754	-0.7151	7.2360*	12.6768*
	(0.2074)	(0.1703)	(0.0891)	(0.9654)	(0.8947)	(0.9146)	(0.0769)	(0.0743)
D(LPR)	-2.0889	-2.4909	9.0850	8.1599	-3.2095	-4.1575	11.5649*	1.2134
	(0.4951)	(0.4252)	(0.2269)	(0.2498)	(0.5916)	(0.4781)	(0.0848)	(0.9000)
D(LCL)	11.7379*	12.7756*			7.2335	8.5756		
	(0.0903)	(0.0778)			(0.4270)	(0.3565)		
D(LRESOURCE)*D(LINFRAST)		-6.7658				-7.9140		
		(0.6478)				(0.6777)		

D(LRESOURCE)*D(LPR)			41.7517*				47.6765**	
			(0.0650)				(0.0279)	
D(LRESOURCE)*(LHC)				-1.1735				-37.8134
				(0.1954)				(0.1040)
ECTC(-1)	-0.9704***	-0.9912***	-1.0334***	-1.2045***	-1.0440***	-1.0767***	-1.0380***	-1.0962***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0003)	(0.0000)	(0.0000)	(0.0000)
R-squared	0.6817	0.6638	0.6737	0.5403	0.4906	0.4756	0.6346	0.4277
Adjusted R-squared	0.5921	0.5692	0.5946	0.4288	0.3268	0.3071	0.5461	0.2800
F-statistic	8.7731***	8.6547***	10.4841***	10.9906***	7.4726***	7.4702***	11.5960***	11.0451***
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Instruments	11	11	11	11	11	11	11	11
Prob(J-statistic)	(0.1705)	(0.1527)	(0.6858)	(0.3049)	(0.8120)	(0.8089)	(0.6055)	(0.8516)
Durbin-Watson stat	1.9355	1.9873	1.9185	2.0654	2.0967	2.1295	2.0161	1.9376
Jargue-Bera	0.0493	1.0493	5.0708		0.9445		3.0567	1.5891
	(0.9756)	(0.1781)	(0.0792)		(0.6236)		(0.2169)	(0.4518)
No. Countries	5	5	5	5	5	5	5	5

Source: Own computation using EViews 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. Table 2. 8 indicates the long-run equilibrium and short-run dynamics of some the EAC

region economic variables. As discussed, the error correction method (ECM) captures the speed of adjustment restores equilibrium in the dynamic model. In other word, the ECM should have a negative sign, and how quickly variables converge to equilibrium. Bannerjee et al. (1998) observes that a highly significant error correction term confirms presence of stable long-run relationship.

Therefore, in summary, the study on the determinants of FDI inflows to the EAC region from 1970 - 2017 indicate that market size attracted FDI in the short run. Moreover, FDI are motivated to invest in the EAC region both in short run and long run due to large market size.

Cheap labour availability and presence of natural resource in the EAC region had zerio effect on foreign investors in the short run. However, in the presnec of political right, natural resource variable had significant influence on FDI in the short run.

We also noted that in the presence of human capital, market size had detrimental effect on FDI in the short run.

We conclude based on Dike (2018) report that all variables included in the study had influence on FDI in the long run due to presence of causality running from explanatory variables to dependent variable. Therefore, the EAC region only received market-seeking FDI in the short run, while in the long run, the EAC region received both the market-seeking FDI type, Resource-seeking FDI type and the Efficiency-seeking FDI type during the study period.

2.5 Conclusion and Recommendations

Our conclusion and policy recommendation are informed by location theory, empirical literature, and our research questions (what are the determinants of FDI to the EAC region?) and they are detailed in the subsections below.

2.5.1 Conclusion

This study has sought to contribute to the understanding of the Foreign Direct Investment (FDI) determinants and the effect of FDI on the economic performance of the East Africa Community (EAC) region. The study consists of five research questions and the first one seeks to understand the determinants of FDI to the EAC region from the year 1970 – 2017. We characterised the determinants of FDI to the EAC region as market seeking FDI, resource seeking FDI, and efficiency seeking FDI (Brehram, 1972; Kang and Jiang, 2012). We concluded based on ur research findings that the EAC region only attracted market seeking FDI during the short-run and long-run periods. However, in the long-run market size played a critical role in determining FDI to the EAC from 1970 – 2017.

Furthermore, we observed that the availability of natural resources in the EAC region itself is not attractive to foreign investors in the short-run vis-à-vis long-run period. For instance, study empirically reveals that the EAC region were able to significantly attract resource seeking FDI

in the presence of political stability as seen in Table 2.8, model 3 and model 7. We also found that the availability of cheap labour in the EAC region had zero effect on foreign direct investment in the short run vis-à-vis long-run periods.

Some variables had significant effect on FDI. These includes among others financial sector development, human capital, civil liberty, and inflation as seen in Table 2.4, 2.6 and 2.8.

The study further shows that all variables included in the model significantly had effect on the FDI to the EAC region during the study period in the long run period. In otherwords, FDI to the EAC region was more pronounced in the long-run compared to the short-run period.

2.5.2 Policy recommendation

The discussion of the location theory and relevant empirical papers on the determinants of FDI to developing countries indicate that multinational corporations (MNCs) in the form of foreign direct investment (FDI) invest abroad to increase companies' profit margin. Based on location theory, host countries factors that reduce production, distribution and marketing costs have the potential to attract FDI. For instance, countries with massive market size, natural resources and a vast pool of cheap b u t productive workforce guarantee economies of scale arising from large scale production, thereby reducing per-unit costs of production incurred by foreign investors.

Therefoe, based on our research findings othe EAC region, we recommend that the East Africa should adopt and implement policies that reduce and restrict foreign investors to invest in any sector of the economy. The EAC region should also have policies of openness, transparency and create a predictable business environment for all kinds of foreign firms. For instance, the EAC region could achieve and improve the predictability of the business environment through regular and early communication by a government agency to investors (i.e., both foreign and local investors).

Furthermore, the EAC region should also improve on the ease of doing business in addition to allowing foreign firms imports advanced production technology that is locally not available. Howver, production inputs available in the region should be sourced locally by foreign investors to promote economic growth of the EAC region. We further argue that when the EAC member states institutes robust framework that promote and protect intellectual property right, in addition to having flexible labour markets as well as improving the efficiency and the effectiveness of the investment promotion agency (IPA), the EAC region will attract all three FDI typology (i.e., market seeking, resource seeking and efficiency seeking FDI).

In the context of resource seeking FDI, we recommend the EAC region to permit foreign investors to access and invest in all form of natural resources such gold mining, forest, natural gas, and petroleum and use of land for commercial agriculture. However, our empirical study shows that to have natural resources without political stbility is not sufficient to encourage FDI to the region during short period. In addition, we propose that the EAC region should provide tax breaks for foreign investors, particularly those of resource seeking FDI. This is because the initial investment in natural resources such as mining and oil exploration involves enormous sunk costs, and so government should provide incentives such as tax holiday.

Moreover, the EAC region should also improve her per capita resource availability. For example, in terms of fisheries, fishing in Lake Victoria needs restriction to prevent depleting the number of fish available in Lake Victoria. We recommend using the right fishnets that catches only mature fish. Additionally, preventing overfishing will allow quick restocking of the fish stock in the region. In terms of forest, forests in the region can be preserved by stopping deforestation like the case of Mabira forest in Uganda.

Moreover, the EAC region should improve the availability of the labour force through training to attrack efficiency seeking FDI. Yuanfei and Fuming (2012) indicate that labour costs, a measure of efficiency seeking FDI only attracts FDI if labour costs in the host country are lower than the source country. Yuanfei and Fuming further cited the work of Sethi et al. (2003), which suggest that countries with lower costs of labour can attract more FDI.

In this thesis, we used the EAC region citizenry age between population ages 15-64 (% of total population) as the measurement for the available labour force. Our recommendation is that for the EAC region to attract more efficiency seeking FDI, the EAC member states should take a deliberate effort to improve the productivity and health of labour force.

In context to market seeking FDI, we recommend that the EAC region should impose tariffs on imported goods. These imported goods mainly from China are cheap and would discourage any foreign investors to invest directly to the EAC region as Chinese act in predatory pricing to under cut local production, where production costs might be much higher. For instance, foreign firms might face higher costs of production steming from high cost of electricity, luck of storage facilities, and inadequate transportation system which all could drives up costs for foreign investors. Therefore, potentially detering foreign investors to invest locally to service domestic market.

As mentioned above, offering tax breaks or lower tax rate to market seeking FDI would incentivize foreign firms to invest locally either in the form of brown investment or Greenfield investment. Therefore, we recommend that Uganda Investment Authority (UIA), Kenya

Investment Authority (KIA), Tanzania Investment Centers (TICs), in addition to Rwanda Development Board (RDB) and Burundi Promotion Investment Agency (API) and other related investment promotional bodies in the EAC region to market and promote investment opportunities to foreign investors.

When the region intensifies the promotion of investment opportunities to the outside world, the resultant effect could be the increase inflows of foreign investors to the region. This because foreign investors interpretation of the intense investment promotions is seen as a signal that the region is ready to accept foreign investors and offer attractive incentives such as tax holidays.

Chapter Three

3.1 FDI and Growth Nexus

In Chapter 3, we studied the effect of FDI on economic growth as well as the effect of FDI on sectoral output (i.e., ratio tradeable output to non-tradeable output) on economic growth of the EAC region during the study period. Our theoretical model is based on neoclassical growth theory (i.e., Solow growth model (1956)). We also used neoclassical growth theory in Chapter 4, Chapter 4 relates to the study FDI and income convergence in the region. Note, in this thesis, FDI means FDI net-inflows (%of GDP).

In Chapter 3, our theoretical model based on Solow growth model dictates that the dependent variable be economic growth while our explanatory variable consists of FDI, the ratio tradeable output to non-tradeable output, in addition to other growth control variables usually included in the growth model.

The Solow growth model is constructed around the neoclassical aggregate production function. On left-hand side of the equation consist of dependent variable while regressors on the right-hand side. The slope of the production function measures the marginal product of capital – and according to Solow the marginal product of capital (MPK) should be much higher in developing countries compared to develop economies.

Solow model endogenized capital (i.e., capital stock no longer exogenous) –and that capital accumulation is seen as possible engine for economic growth in the long run. The model also shows that labour in the economy is exogenously determined at constant level. The model indicates that as capital stock moves to steady state so does output. Therefore, at steady-state level, capital is positively correlated with investment rate but negatively correlated with depreciation.

The Solow growth theoretical model provides a structure to capture the effect of FDI and the ratio tradeable output to non-tradeable output on economic growth and whether income convergence exist in the EAC region (discussed in Chapter 4). According to Neoclassical growth theory it is expected that FDI should contribute to economic growth and that increase in capital stock should result to income convergence in the region as the economy approaches its steady state. Solow growth model (1956) shows that capital accumulation is the main engine of growth – it also assumes constant return to scale in capital and labour hence explaining occurrence of income convergence.

Therefore, in chapter three we attempt to provide answers to research question on the effect of

FDI on economic performance of the EAC region. Also, we explore the role of sectoral output on economic growth of the EAC region. We did so by answering research question seen below.

Does FDI contribute to the overall economic performance of the EAC region and what is the role of FDI on the ratio tradeable output to non-tradeable output? Also, what is the contribution of the ratio tradeable output to the non-tradeable output on the economic growth of the EAC region?

We did so by discussing growth theories which provided sound analytical framework to capture effects of FDI on growth at aggregate and sectoral level. We use the same analytical theory to understand the contribution of sectoral output on growth of the EAC region.

The concept economic growth relates to increase in services and goods produced in an economy over time. According to Solow (1956) growth theory investment resources that produces capital goods is key to supporting country's economic performance. Further, that growth of labour force must equate to capital stock. Otherwise, low capital-labour ratio results to decline in productivity of labour. The endogenous growth theories (Romer, 1986; Lucas, 1988; Arrow, 1962) observed that technological progress and development in human capital guarantees countries long-run economic growth. In our thesis, our key interest is on contribution of investment capital (FDI) on economic growth. Also, labour force, technology and human capital among others are growth determining factors and so their contributions to economic growth of the EAC region are accounted for in the study.

Our review of empirical literatures on growth shows that economic growth that reflects an increase in the aggregate market value of incremental services and goods produced in an economy can be estimated using either Gross Domestic Product (GDP), GDP per capita, GDP growth rate, Gross National Income (GNI) (Antwi et al. 2013), real GNI or real GDP (Mun et al. 2008)

In Chapter Three, we discussed the growth theories and the empirical literature on the effect of FDI on aggregate and sectoral output of the economy in the EAC. Further, we discussed literatures on the role of sectoral output on economic growth of the EAC region.
Moreover, we concentrate on the empirical literatures on African economies. The section also contains methodology and empirical results. We also provided the brief concluding remarks.

In terms of growth theory, there are two leading growth theory discussed when investigating FDI-economic growth relationship. These are exogenous and endogenous growth theory (Murtala and Shallahuddin, 2015; Almfraji and Almsafir, 2013; Liu et al. 2001). Moreover, these growths also provide a reasonable explanation regarding income convergence (Liu et al. 2001). Therefore, in this study, we discussed exogenous and endogenous growth theory. The

theoretical discussion enables us to formulate an economic model that explains the effect of FDI on economic growth. We use the same growth theory in our chapter four, FDI and income convergence. We started our discussion with neoclassical growth theories, followed by exogenous growth theories.

3.1.1 Neoclassical Growth Theory

The neoclassical growth theory has been made famous by Solow (1956) growth theory. Therefore, the neoclassical growth theory is also known as the Solow growth theory. The theory emphasises that the developing economies should grow much faster than the wealthier economies, resulting in income convergence over time. The central point of neoclassical growth theory lies in its assumption of diminishing returns to the capital stock in the production process and the steady state economy. The basic concept of steady state refers to a point where the economy does not experience real growth. Therefore, any additional investment capital is meant to replace depreciated capital stock. According to Solow, the concept diminishing returns to capital is where the marginal output of capital decreases due to the incremental addition of capital as a factor of production. However, for diminishing returns to capital to happen, other factors of production such as labour and land needed to be held constant during the production processes.

Therefore, given the concept of diminishing returns to capital and steady state of the economy, according to Solow (1956), the developing economies or region with low capital-output ratio should grow much faster than those regions with high capital-output ratio. This result in income convergence as the poorer economies catches-up with the richer economies. In other words, given the negative relationship between the rate of return and capital stock, Solow (1956), suggests, in a globalised world, where economies are highly integrated, the
income convergence would be experienced over time as capital flows from developed to developing economies seeking a higher rate of return on capital.

For instance, consider developing East Africa Community (the EAC) region, from Solow growth model perspective, the economic growth of the EAC region would happen due to the increased flow of productive capital investment from developed countries to the region (i.e. the EAC region). We posit that foreign investors seek a higher rate of return on their investment (Armstrong and Taylor, 1999). It is thereby resulting in the faster economic growth of the EAC region compared to developed countries like the UK or the US. Over time, the income of the EAC region would catch-up with those of the UK and the US, hence income convergence.

The convergence process happens because of the presence of productive investment capital from

developed economies to the developing region of the world (i.e. the EAC region). Therefore, the case for MNCs in the form of FDI from developed to developing countries is quite essential. We note that FDI not only provides needed investment capital but also brings advanced production technology to poorer countries. Besides, because of intense competition between local and foreign firms, the local firms might copy advance production skills from foreign firms. When local firms copyy foreign technology, it allows domestic firms to improve their production. Therefore, a combination of foreign capital with above-cited advantages results in economic growth for the poorer economy (Rey, 2004). However, this faster economic growth experienced by the EAC region vis-à-vis those of the US and the UK is because according to Solow, the EAC region, is considered underdeveloped economies, and has a low capital-output ratio. Therefore, an additional increase in the unit of productive capital, in the form of foreign direct investment would result in a much larger output of goods and service for the EAC region. Moreover, this is made possible due to globalisation that permits the free movement of investment capital across the world.

In light of Solow's proposition of economic growth and income convergence, numerous empirical studies were directed towards testing contribution of FDI on income convergence (Dune, 2017; Kumo, 2011; Xavier and Sala-i-Martin, 1996) and influence of FDI on economic growth (Sunde, 2017; Chiwira and Kambeu, 2016; Mbuawa, 2015). This empirical literature on FDI and growth relationship, in addition to the influence of FDI on income convergence, are extensively discussed in the growth Chapter Three.

In summary, the review of Solow (1956) growth theory suggests that the regional economic disparities are only short-term phenomena. Therefore, in the long-run, the regional income disparity would automatically disappear.

3.1.2 Endogenous Growth Theory

The endogenous growth theory was developed to address the weakness associated with the Solow growth theory. For example, the limitation of Solow growth model (1956) comes from the idea that although technological advancement causes long term national economic growth, however, the technological development is exogenously considered in the model. And thatwhen economies reaches steady state, growth stops. Another weakness of Solow mode is that it cannot provide a theory of long run growth mechanism. For instance, saving as noted by Solow equates to investment capital goods like factories machine to produce goods. However, due to diminishing return to capital – capital accumulation itself is unable to sustain economic growth and so saving and investment only explains short run growth but not sustain long run economic growth. So, the

model does not explain why growth happens as capital accumulation cannot be an engine of economic growth in the long run. Therefore, weakness of Solow growth model (1956) resulted into development of endogenous growth theory.

The features of the endogenous growth model lie on its emphasis on the importance of a country investing in both the human and physical capital. Moreover, the theory also assumes the presence of increasing returns to both the physical and human capital in the production processes.

According to Lavezzi (2003), Lucas (1988) and Romer (1986) are critical contributors to endogenous growth theory. Besides, Hamid and Pichler (2011) noted that Lucas (1988) and Romer (1986) models are usually adopted when examining variation in economic growth among countries, and also how the productivity of factors of production can be improved in order to maximise the output of scare input like human capital.

Murtala and Sllahuddin (2015) observation of Lucas (1988) and Romer(1986) growth theories is that, for growth convergence to occur between developing and developed economies, there should be idea gap bridging between the rich and developing countries. However, the idea gap bridging between developing economies and developed economies happens through the improvement of the absorptive capacity of developing economies. However, the improvement of country's absorptive capacity only acts as a necessary condition, for poorer countries to benefit from advance technological spillover arising from international trade and foreign direct investment to the local economy (Crespo and Fontoura,
2007). According to Crespo and Fontoura (2007), it seems that for developing economies to catch up with developed economies, she must invest in research and developing (R&D) in order to generate new ideas that result into product and process innovation. In so, it facilitates the concept of idea gap bridging between the developed and developing countries. In other words, investment in R&D by firms is the central pillar of endogenous growth theory

Moreover, Wei et al. (2001) and Graft (1996) presented two main types of endogenous growth theory. These are the endogenous broad capital model and endogenous innovation growth model. Wei et al. (2001) observation of the endogenous innovation growth model is that technological progress arises from intentional innovation.

According to Wei et al, the endogenous broad capital model emphasised the positive externality generated by investment in human and physical capital, as well as other related technology characterised by ‘learning by doing' (Arrow, 1962) and ‘knowledge spillover’. Romer (1986) models show the importance of technological spillover emanating from firms undertaking research and development (R&D), leading to knowledge creation. Moreover, Romer (1990)

noted, because educated employees undertake R &D, Romer (1990) noted that there is a positive association between economic growth and human capital stock. Romer's (1990) observation is that human capital increases labour-force productivity. According to Romer (1986) and Lucas (1988), the three principal causes of economic growth results from innovation, which comes from R&D, creation of new knowledge by the firm and the presence of public infrastructures such as efficient road network. Grossman and Helpman (1991) and Romer (1990) have both cited the relevance of innovation, knowledge creation and presence of public infrastructure in supporting the economic growth of an economy.

Besides, North (1990) concurs with Grossman and Helpman (1991), and Romer (1990) posits firms (i.e., foreign and domestic) should create new knowledge and product innovation through R&D. However, North states that this is conditioned on the country achieving institutional quality (i.e., the strong rule of law and control of corruption) threshold capable of incentivising foreign and domestic investments and generate economic rent.

In a specific term, Markusen (1995) suggests that developing countries such as the EAC member countries would benefit more from attracting horizontal FDI than vertical FDI type. Horizontal FDI mainly happens to avoid trade barrier, reduce transportation costs or custom barrier. Therefore, the concept of horizontal FDI is associated with MNCs firms making the same products produced at home in the foreign market.

According to Markusen, the advantage linked to horizontal FDI is that it tends to use local raw material (intermediate input). Also, this would result in more significant technology transfer from foreign investors to local firms. Markusen observes that technology transfer happens through the mechanism of training local firms by innovative foreign investors. Moreover, domestic firms can easily imitate advance local production technology. Besides, horizontal FDI also might result in an intense competition between a foreign firm and domestic firms. This increased competition results in the efficient use of scarce resources by local firms due to improve production technology adopted from a foreign company (Soreide, 2001)

However, Boresztein et al., (1998) noted that the ability of local firms to absorb foreign technology is conditioned on local firms acquiring minimum human capital that permit imitation of advanced foreign technology by domestic firms. Therefore, horizontal FDI tends to create a more significant interaction between foreign and local firms (Markusen, 1995). According to FDI typology (Brehman, 1972), horizontal FDI is seen to be associated with marketing-seeking FDI type while vertical FDI is to efficiency-seeking FDI. For instance, According to Markusen, we defined verticle FDI based on their investment formula in that, MNCs in the form of verticle FDI tend to locate some part of their production stages in a foreign country primarily to cut costs.

Their products are mainly exported to the international markets. Therefore, the argument is that vertical FDI does not benefit the local economy due to limited technology transfers from foreign subsidiary firms to domestic investors. Moreover, vertical FDI tends to use limited local intermediate inputs. Hence vertical FDI is assumed to have limited influence on the economic growth of the host economy (Markusen, 1995).

Rodriguez-Clare (1996) introduced the concept of 'forward' and 'backward' linkages. Rodriguez-Clare suggests that local firms benefit more from the MNCs in the form of FDI only if there is more significant technology spillover from foreign firms to local firms. Rodriguez-Clare noted that technology spillover does occur due to increase usage of locally produced intermediate inputs by observed that foreign firm. Therefore, this results in the productivity increases for the local firm. Besides, that FDI embodied advance technology which displaces formerly rudimentary technology used by local firms in the production processes. It is in this context that the transfer of advanced production technology from foreign to local firms supports the productivity of domestic firms by crowding-in domestic firms.

Furthermore, Rodriguez-Clare (1996) observed that developing countries would benefit from horizontal FDI if it uses large amount of local intermediate inputs to produces goods and services for the domestic market. Therefore, the use of local input results in technology transfer from foreign firms to local firms through training or imitation (Gorg and Greenway, 2003).

Earlier studies by Arrow (1962), Uzawa (1965) and Lucas (1988) posit models that seem to suggest that human capital accumulation is critical in supporting long term economic growth of developing countries. For instance, Lucas (1988) suggests that there is a positive association between technological development and human capital accumulation. While Uzawa noted that technology embodied in human arises from increased investment in the human capital, which results in technological progress through R&D. However, to the benefit of globalisation, poorer countries are now able to access this technological progress through FDI. According to Arrow (1962), a country's technological change might occur due to ‘learning by doing' processes. Through experience and learning from different foreign technology, domestic labour productivity increases as they discover new ways of producing goods and service.

More importantly, Arrow (1962) pointed out that a new advanced machine at work does stimulate learning and thereby increasing labour productivity. In the case of the EAC region, the advance new machine which stimulates learning and thereby supporting economic growth are usually available through FDI. This is because the EAC region has limited human capital and needed financial capital to invest in R&D. Therefore, FDI is critical for the region's economic growth. This is because the country's R&D capability is attainable through the intended investment in

human capital and expenditure on R&D (Chilarescu, 2010; Graft, 1995) something that is lacking for the EAC region and only obtainable through FDI

In the discussion of the endogenous growth model, Wei (2001) presented a standard production function of the endogenous innovation growth model by following the working of Grossman and Helpman (1991) as seen in equation (3.1).

$$Y = AK^{\beta 1}L^{\beta 2}M^{\beta 3} \quad (3.1)$$

From equation (3.1) the left-hand side of the equation represents the country's output, and the right-hand side captures growth determinants. β_{1-3} reflects the contribution of each explanatory variables on the production of national output.

According to Wei et al, M consists of an index of created intermediate products that embodied technological knowledge. However, this technological knowledge is improved (augmented) through innovative activities, brought about by R&D. In the production function, the contribution of labour in the production of intermediate product (goods) is constant. Romer (1986) acknowledged the possibility of technological spillover arising from firms undertaking expenditure of R&D, which leads to knowledge creation. In this context, M, which consists of intermediate goods that entail technological knowledge, positively depends on the amount of skill labour allocated to undertake R&D. Therefore, the deployment of more skilled labour by firms to conduct research increases the spillover effect emanating from the increase in technological knowledge brought about by R&D.

Across the world, product innovation differs as a result of the difference in the research capabilities. According to Wei et al, the individual country's own social, economic environment and political structure offers a better explanation of the country's ability to carry out advanced research that leads to product innovation.

Therefore, the difference in the innovation process across the world have resulted in diverge rate of economic growth among the world economy. From equation (3.1) above, the model suggests for an economy to witness a higher economic growth rate, the firms should possess an excellent capability to generate new technological ideas. However, this creation of new technological ideas by firms only comes through the increased allocation of R&D funding. In other word, R&D acts as a mechanism for firms to generate new technological ideas. However, as cited North (1990), the presence of institutional qualities such as a strong rule of law would protect firms' intellectual property, thereby allowing innovative firms to enjoy a monopoly right from the discovered new technological idea, which inturn permit innovative firm to make huge profits. It is this enormous profit that incentivises innovative firms to invest further in on R&D.

Wei et al. noted that in the endogenous innovation growth models, that the growth model permits the presence of numerous steady states and a persistent divergence.

Endogenous innovation growth theory also allows for the possibility of convergence within the integrated world economy, and this is because of the interdependency of the world economy, which allows the transfer of advanced technology from leading country to poorer nations. For instance, this is made possible on conditioned that the leading economy like the UK continues to undertake R&D, resulting in a ‘cutting age' technology. This innovation if it can be effectively and efficiently copied at a low cost and assimilated into the production process by firms residing in less innovative countries like the member countries of the East African Community (EAC), then this can result into convergence process between the UK and the EAC member countries.

Romer (1993) observed that a country's rapid economic growth depends on access to new technological ideas generated through R&D. Moreover, diffusion of the new technological idea through production structure cannot be understated. In other word, firms should create a production process that allows for effective diffusion of new technological ideas to all labour force. Therefore, the diffusion of advanced technology increases employee's productivity (Canton et al. 2005).

Therefore, access to the new technological ideas and the ability of local firms to imitate the advanced technology would benefit the local firms in the developing economies. The benefits of adopting new technology can increase the productivity of local firms. However, the ability to imitate and adopt foreign technology by the local firms can be enhanced through investment in human capital, FDI, R&D and international trade.

Boresztein et al. (1998) reported that development in human capital is the key driver of economic growth. Romer (1990) reported that it is an educated workforce that undertakes R&D. Therefore, according to Romer (1990), there should not be any doubt amongst economic professionals to accept the idea that R&D is an essential ingredient to sustained country's long-term economic growth. Wei et al. (2001) reported that R&D takes two forms. Firstly, R&D would result in improves imitation ability by local firms while the second form results in product innovation. In other words, R&D upgrades firm's technological capacity and capability to innovate and increase production efficiency hence having a positive long term effect on the economic growth of the country.

Therefore, companies that allocate funding for R&D do acquire advanced technological know-how, in addition to building their intangible asset. Dunning (1977) refers to these intangible assets acquired by firms as ownership advantage. The acquisition of advanced technological

know-how and intangible assets allow firms to enjoy a more significant return on their investment inform of huge profits. Therefore, the overall impact of firms in developing countries actively pursuing R&D is that it increases the entire country's output. Therefore, these present a possibility of poorer countries to catch-up with more prosperous economies through having the ability to imitate and carry out innovation to improve the local firm's production process.

In fact, according to Balasubramanyam et al. (1996), under endogenous growth theory, most growth influencing factors such as advanced technology can be imitated and customised to promote economic growth for developing countries. Therefore, FDI offers a favourable channel to improve growth determining factors. The idea is that FDI embodied advance managerial skills, capital, and tacit technology. The unique part of tacit technology is that it is difficult to communicate from one person to another due to its characteristics such as difficulty to write it down, visualise. Therefore, tacit knowledge is difficult to copy. However, FDI plays a role in the transfer of the tacit technology because experts come to host countries and train local employees hence transferring valuable knowledge to local firms.

In this context, that unique role of FDI plays in the tacit technology transfers and diffusion crucial for economic growth cannot be substituted by other means of international arrangement like international trade. No wonder, empirical evidence shows that countries that host FDI benefits, particularly developing economies, witness an increase in the firms' economic output. We believe that the benefit of hosting FDI could be due to competition between local firms and foreign firms, as well as positive technological spillover from foreign to domestic firms. Because MNCs enjoys large pools of financial and skills employees than local firms, they innovate much faster; identify new production techniques and new products much earlier than local firms. Therefore, for local firms to protect their market share from foreign companies, they are forced to innovate their production process to remain efficient and introduce new products. However, because they do not have the resources to undertake R&D, they end up imitating different foreign's products and production technology.

However, Dunning (1977) ILO framework and internalisation FDI theory suggests that MNCs would internalise their production processes. Internalising production process defends MNCs from the perceived risk associated with transacting through the market, for instance, fear that local firms would gain their advanced production technology and start to produce products that threaten their market share. This forces the foreign firms to internalise rather than transact through the market for fear of competition with local firms for a limited market. Also, MNC tries to preserve its innovative production skills and managerial knowledge from local firms. However, due to positive spillover effect arising from MNCs to local firms by the mechanism of ‘learning by watching' or ‘learning by doing' (Arrow, 1962), productivity of local firms improves hence

resulting into economic growth of the host economies.

Moreover, switching of labours from a foreign subsidiary to local firms, present the most efficient mechanism through which advanced foreign technology can be transferred to the local firms. The benefit of technology transfers through employee movement between industries (i.e. inter industries) or within industries (i.e. intra-industry) is cost-effective. The reasoning is that local employees formerly working for foreign firms already possessed advance production and management skills acquired from working for foreign firms, and so, they do not need training, hence saving costs in term of time and money. It is because of above-cited advantage associated with MNCs in the form of FDI is considered the primary source of economic growth of developing economies.

International trade also provides another avenue through which technology transfer and creation can be achieved by developing economies. There is a consensus that international trade is appositive associated with economic growth (Chapsa et al. 2015, Wei, et al. 2001). Moreover, Coe et al. (1997) and Grossman and Helpman (1991) both forwarded channels through which trade, positively influence the economic growth of participating countries. The argument in favour of international trade is based on the assumption that the trading countries are open to using new sets of advanced production technology.

For example, consider the East Africa Community region, where agriculture is her primary source of revenue. Through international trade, local firms can acquire a variety of excellent agricultural pieces of machinery and farm management skills. In other words, through trade, the EAC region acquires advanced farming technology and farm management skills, hence increasing the productivity of arable land, and that this results in economic growth. Therefore, empirical evidence suggests that the country's economic growth is positively linked to international trade (Chapsa et al. 2015).

Therefore, according to Coe et al. (1997), Grossman and Helpman (1991), international trade permits and encourages cross-boarding learning. That is, poorer countries learning from wealthier nations by imitating a variety of different technology created through R&D. The diffusion of a variety of different foreign technology to developing economies increases the productive capacity of local firms. Therefore, we argue that the convergence will happen in an integrated economy, where developing economies benefit from developed countries through the free movement of capitals and people in the form of FDI.

Moreover, when countries, particularly developing countries, invest in human capital, it increases developing country's human capital base, the ability for poorer countries to undertake

R&D related activities. Moreover, it increases the capacity for developing countries country to absorb and learn advance foreign technology. This inturn increases the productivity of developing countries as local firms uses physical input more effectively. Therefore, human capital has a decisive role in economic growth (Boresztein et al. 1998).

Mankiw et al. (1992) observed that when studying factors that affect economic growth, variables such as population growth and saving rate would be biased upward when the human capital variable is not controlled in the model.

Therefore, the contribution of human capital through knowledge acquisition is central to the economic growth of developing countries

As discussed above, since innovation and imitation are positively linked to the country's quality and size of the human capital base. It is a necessary condition for developing economies to invest in human capital by increasing expenditure in the education sector, promoting and encouraging on-the-job-training (Arrow, 1962). The developing countries can achieve human capital through their government providing financial assistance, and technical expertise to training schools. Therefore, the development of human capital will encourage and develop innovative capacity and progress of the poorer nations. We note that it is the development of human capital that will lead to a catch-up process between developing and developed economies (i.e., income convergence).

Therefore, in the context of the country's economic development and the ability for new knowledge to diffuse within the economy, the presence of international trade, human capital and expenditure in R&D is critical. Therefore, according to Wei et al. (2001), human capital, R&D, and international trade according can now substitute index of innovation creation in the simple endogenous innovation growth model. This results in a modification of equation (3.1) as seen in equation (3.2). The relevance of equation (3.2) is that it allows us to capture the contribution of trade, human capital and R&D on national output.

$$Y = AK^{\beta 1}L^{\beta 2}Trade^{\beta 3}HC^{\beta 4}R\&D^{\beta 5} \qquad (3.2)$$

Where on the left-hand side is the country's national income (i.e. output) and β_{1-5} reflects the contribution of independent variables on the dependent variable. This implies that the country's national income depends on the productivity of each factor of productivity seen on the right hand side of the equation. These growth determinants, as seen in equation (3.2) consist of K which stand for capital, L reflects country's labour, while trade refers international trade and R&D consist of expenditure on research and development. These variables are expected to have a decisive role in the technological growth rate, hence supporting economic growth. Therefore, in the presence

of integrated and interdependent economies, transfer of technology from developed to developing economies would result into conditional income convergence (for the discussion of income and FDI convergence refer to Chapter four).

Finally, in chapter 3, we discussed two growth theories. The neoclassical growth theory (Solow growth model (1956)) and endogenous growth theory. We stated that endogenouse growth theory emerged because of weakness in the Solow growth model (1956). For instance, Solow growth model (1956) could not explain sustained long-run growth witnessed in the developed world economies like the UK, the US and German. However, both models recognized the need for capital accumulation to propel growth in the short run period – and that increase in capital stock originates from extra investment. In other words, both endogenous and exogenous growth theories recognized the critical role played by foreign direct investment on country's economic development.

3.2 The empirical literature review on the role of FDI on growth at aggregate level.

We have analyzed empirical studies on the effect of foreign direct investment on the economic growth. We focused mainly on developing countries. Particularly, we concentrated on analysis on empirical studies on FDI-growth nexus in Africa. We wanted to find out if existing empirical literature have looked the effect of FDI on the economic growth of the East Africa Community (EAC) region. Moreover, we were interested in the studies that have considered extended study period as we believe this would provide reliable information on the FDI – growth nexus in the EAC region. To establish research gap, we divided our studies into panel and time series studies. We started by presented analysis on time series as seen below, and subsequently followed by panel data studies.

3.2.1 Empirical literature review on growth (Time-series study)

In our analysis of the Sunde (2017), we found that Sunde studied the effect of FDI on the South African economy from 1970 – 2014, and utilized GDP as a proxy for the economic growth of South Africa. Sunde adopts several estimation techniques. For instance, ARDL Bound testing was applied to capture the long-run relationship among variables, while ECM was used to capture short-run dynamics.

Furthermore, Sunde noted that VECM Granger Causality was used to report the direction of causality. The result from ARDL Bound testing shows the long-run relationship among variables understudy while VECM Granger Causality indicates the presence of unidirectional causality running from FDI to economic growth. From Sunde studies, also found that South African benefited more from FDI in the long run than the short run. Chiwira and Kambeu (2016) and Mbuawa (2015) both examined the effect of Foreign Direct Investment (FDI) on the performance of Botswana's economy. Chiwira and Kambeu (2016) adopted the Johansen cointegration test capture relationship among variables and ECM to established short and long-run relationship while Mbuawa (2015) also applied VECM. Chiwira and Kambeu (2016) and Mbuawa (2015) Granger Causality suggests that FDI did not improve the economic performance of Botswana during the study period. For instance, Chiwira and Kambeu (2016) study period range from 1980 –2012 and applied the real gross domestic product (RGDP) as a proxy for economic growth. On the other hand, Mbuawa (2015) study period started from 1975 – 2012 and utilized the annual GDP growth rate as a measurement for economic growth.

Moreover, Munyanyi (2017); Chidoko and Sakuhuni (2015) and Moyo (2013) all found that Zimbabwe has benefited from FDI through improvement in the economic growth of Zimbabwe. We observed that Munyanyi used RGDP as a proxy for economic growth while Chidoko and Sakuhuni (2015) and Moyo (2013) uses Balance of Payment (BOP) and GDP as a proxy for economic growth respectively. Furthermore, we found these studies to have adopted different methodology while arriving at the same conclusion that FDI improves the economic growth of Zimbabwe. For instance, Munyanyi study involves a study period from
1975 – 2007 utilized ARDL and Bound testing technique and found FDI to have a positive, and significant effect on the economic growth of Zimbabwe. However, Chidoko and Sakuhuni (2015) and Moyo (2013) study periods range from 1981 – 2013 and 2009 – 2012 respectively and both used simple Ordinary Least Square (OLS) estimation techniques and both found positive FDI-economic growth relationship. We weakness Chidoko and Sakuhuni (2015) and Moyo (2013) estimation technique as it can control for endogeneity problem. Moreover, Moyo (2013) study period is too short of providing reliable results. Conversely, Munyanyi study involves longer study period and tests for serial correlation, the stability of
The model and heteroskedasticity before estimating the model hence Munyanyi results provides better empirical understanding on the effect of FDI on the economic growth of Zimbabwe.

In the year 2015, Jilenga et al., and Marobhe studied the effect of FDI on the economic performance of Tanzania from 1971 – 2011 and 1970 – 2014, respectively. We found that Jilenga et al., the study applied ARDL and Bound testing technique and adopted RGDP measurement as a proxy for economic growth and found FDI to have improved economic growth of Tanzania. However, Marobhe's study uses the Johansen cointegration test and reported rejection of the null hypothesis that FDI does not Granger cause economic growth of Tanzania during the study. We report that studies by Jilenga et al. and Marobhe uses a more extended study period and thereby able to capture the meaningful effect of FDI on the economic growth of Tanzania.

Besides, Mpanju (2012) studied the effect of FDI on the economic performance of Tanzania from 1990 – 2008. Mpanju's uses employment effect as a proxy for the economic performance of Tanzania. Mpanju found that although FDI had a positive effect on employment, it was insignificant. For instance, result from OLS shows that a unit increase in the FDI would result in 0.0000 units improvement in employment in Tanzania. Our observation on Mpanju study lies on point, first study period very short, and OLS estimation technique is prone to providing spurious results if serial correlation and heteroskedasticity in not accounted for in the model. Besides, the insignificant effect of FDI on employment creation in Tanzania might be explained by a little volume of FDI vis-a-visa Tanzania's labour-force. Lower FDI employment ratio reduces the

significance effect of FDI on employment in Tanzania. Klobodu and Adams (2016) and Sakyi et al. (2015) and Antwi et al. (2013) studied the effect of FDI on the economic growth of Ghana and found FDI benefited Ghana's economy. For instance, Klobodu and Adams (2016) examined the effect of FDI on economic growth from
1970 – 2014 and use GDP per capita as proxy for economic growth, while Sakyi et al. (2015) and Antwi et al. (2013) study period ranges from 1970 – 2011 and 1980 – 2010 respectively. Furthermore, Sakyi at al. (2015) uses GDP as a proxy of economic growth while Antwi et al. (2013) economic growth proxy by GDP per capita, GDP, GDP per growth rate and gross national income (GNI).

Antwi et al. by using OLS method found that FDI had a positive effect on GDP, GDP growth rate and GDP per capita, and Klobodu and Adams (2016) however applied Two-Stage-Least-Square (TSLS) estimation technique and found FDI affected GDP per capita (i.e. economic growth). Sakyi et al. (2015) adopted the ARDL and Bound testing technique and found that FDI had a positive effect on economic growth (GDP) in economic growth.

In the year 2013, Insah explored the relationship between FDI and economic growth of Ghana from 1980 – 2010. Insah study entails analyzing the effect of FDI on Ghanaian economy from current to previous FDI by incorporating FDI lag one to lag three. The study uses GDP as a proxy for economic growth. Insah also noted that the selection of Dynamic Ordinary Least (DOLS) estimation based on VAR estimation that is unrestricted is a useful technique for study with short study period. Moreover, the Johansen cointegration test and ECM were all involved in the study. The study indicates the presence of a short-run and long- run relationship between FDI and economic growth of Ghana. We observe that during the study period, FDI exerted economic pressure on the Ghanaian economy different. For example, a unit increase in FDI lag one and FDI lag two resulted into increase in economic performance in Ghana by 0.13 units and 0.19 units respectively and all statistically highly significant. However, it turns out that a unit increase in FDI lag three only resulted in economic growth by 0.10 units and significant. We observe that the effect of FDI declines both in significance level and magnitude the longer FDI operates in Ghana.

Gungor and Ringim (2017) examined the linked between FDI and economic growth in Nigeria from 1980 – 2015. The deployed Johansen Multivariate cointegration test and VECM as an estimation technique. Johansen cointegration test shows the presence of a long-run relationship between FDI and economic growth. However, the result from Granger Causality shows the presence of unidirectional causality. In another word, Gungor and Ringim study indicate that FDI causes economic growth and statistically significant. Moreover, Gungor and Ringim's based

on Pearson correlation coefficient of 0.782 further shows a positive association between FDI and economic growth of Nigeria. We conclude based on Gungor and Ringim empirical findings that Nigerian economic benefited from FDI during the study period.

Aigheyisi (2016) study examines the effect of FDI on economic growth through stock market development in Nigeria. The study period ranges from 1981 – 2014. Aigheyisi applied Fully Modified Ordinary Least Square (FMOLS) estimation technique and economic growth variable proxy by RGDP per capita. Aigheyisi empirical results suggest that FDI on its own significantly improves the economic growth of Nigeria by 0.077 units for every unit of FDI
increase in Nigeria during the study period. Unfortunately, we observed that in the presence of stock market development, the effect on FDI on economic growth has been detrimental and highly significant. Aigheyisi study also accounted for multicollinearity through use of Variance Inflation Factor (VIF). Besides, variables were stationary at first difference, and Johansen cointegration shows the presence of long-run relationship among variable. We suggest the best estimation technique could have been VECM as it suitable for variables integrated in the same order

Uwubanmwen and Ogiemudia (2016) also examined the effect of FDI on the Nigerian economy from 1979 – 2013. Uwubanmwen and Ogiemudia used RGDP as a proxy for economic growth. They also applied different estimation techniques that has Error Correction Method (ECM) to capture both the short and long-run effect of FDI on the Nigerian economy.

Moreover, they further noted that using Granger Causality test enables them to capture the direction of causality between FDI and economic growth. From Uwubanmwen and Ogiemudia study, we observed the presence of a positive association between FDI and economic growth of Nigeria. However, according to Uwubanmwen and Ogiemudia, the effect of FDI on economic growth exist only in short-run, and they recommended prudent macroeconomic management for Nigeria's economy to witness the positive effect of FDI on economic performance.

In the year 2015, Ezeji et al. attempted to quantify the effect of FDI on the economic performance of Nigeria, India and Ghana from 1986 – 2012. Ezeji et al. reported that they applied the Johansen cointegration test to capture the long-run relationship among variables. We found Ezeji et al. study used RGDP as a proxy for economic growth and adopted the OLS estimation technique. Ezeji et al. estimated the effect of FDI on the economic performance of India, Nigeria and Ghana separately and found that FDI has significantly benefited Ghana and Nigeria. We also found that although a positive association between FDI and economic growth exist in India, it was insignificant. We also found similar results that FDI have significantly benefited Nigeria

(Adeleke et al. 2014). In other words, Adeleke et al. (2014) which applied OLS estimation technique to capture the direct effect of FDI on economic growth (proxy by GDP) of Nigeria from 1999 – 2013 found that Nigerian economy significantly benefits from FDI by 0.364 units for an additional unit of FDI during the study period.

Abdu (2013) and Ugochukwu (2013) both examined the effect of FDI on the Nigerian economy from 2000 – 2010 and 1981 – 2009, respectively. We found that both Abdu and Ugochukwu proxy economic growth by GDP and that both use the same estimation OLS estimation technique. Furthermore, although Abdu (2013) and Ugochukwu (2013) found FDI to have a positive effect on the economic performance of Nigeria, it was statistically insignificant.

Anfofum et al. (2013) examined causality between FDI and economic growth of Nigeria. They Johansen cointegration test to the established long-run relationship among variables under study after undertaking diagnostic tests such as Jarque Bera normality test, white heteroskedasticity test as well as Ramsey reset. Anfofum et al. results based on The Johansen unrestricted cointegration rank test suggest the existence of a significant long-run relationship between economic growth and FDI. Pairwise Granger Causality was then applied to the ascertained direction of causality between FDI and economic growth. Anfofum et al. found that FDI does not Granger cause economic growth during the study period.

Moreover, Danja (2012) and Agbo (2012) both studied the impact of FDI on economic growth in Nigeria and also used GDP as a proxy for economic growth. Danja (2012) and Agbo (2012) empirical studies both used the OLS estimation technique and found FDI to have significantly resulted in the economic growth of Nigeria during the study period. Danja reported that for thirty years period, the Nigerian economy has profoundly benefited from FDI while Agbo, whose study period ranges from 1986 – 2007 found that FDI played a critical role in supporting the economic growth of Nigeria. In the same year of 2012, Olokoyo also studied the effect of FDI on the Nigerian economy from 1970 – 2007. Olokoyo applied OLS estimation and proxy economic growth with RGDP. We found that, when Olokoyo estimated the effect of FDI on growth without accounting for serial correlation, the study shows FDI had a significant effect on growth. However, when Olokoyo applied Cochrane Orcutt Iterative method as a way of removing serial correlation, it turns out that FDI harmed Nigerian economic performance during the study period. We observed that Aigheyisi (2016), who also found that Nigeria has significantly benefited from FDI from 1981 – 2014 supports Danja (2012) and Agbo (2012).

In the year 2011, Oyatoye et al. and Ehimare all explored the relationship between Nigeria's economic performance and FDI from the year 1987 – 2006 and 1980 – 2009. Oyatoye et al. and Ehimare both applied OLS estimation technique and concluded that Nigeria has benefited

from FDI during the study period. However, based on Durbin-Watson test statistical value, Oyatoye et al. and Ehimare studies seem to have suffered from the presence of serial correlation and thereby rendering their estimation spurious.

Akinlo (2004) conducted an empirical study on the effect of FDI on the economic growth of Nigeria from 1970 – 2001. Akinlo utilises Cobb-Douglas production function to develop an economic model. Akinlo study uses RGDP as a proxy for economic growth. Furthermore, the Johansen cointegration test was used to capture the long-run relationship among variables, and error correction method (ECM) was adopted to capture the short-run and long-run effect of FDI on economic growth in Nigeria. Akinlo looked at the influence of different stages of FDI on the economic performance of Nigeria. In other words, Akinlo lagged FDI into three, four and five years. From Akinlo results, we found that the intensity of FDI on economic growth in Nigeria is only realised at the later period.

Maliwa and Nyambe (2015) and Dogan (2014) both explored the contribution of FDI on the economic growth of Zambia. Nyambe and Dogan study period range from 1980 –2012 and 1970 – 2011respectively. Furthermore, Nyambe and Dogan both use the GDP growth rate as a proxy for economic growth. We also observed that these studies both applied Johansen cointegration test to examine the long-run relationship among variables and found the presence of a long-run relationship. Moreover, Dogan further applied VECM to ascertain the short and long-run effect of FDI on the economic performance of Zambia. Besides, they based their empirical interpretation on Granger Causality output. Nyambe report suggests that FDI did not benefit Zambian economy during the study period.

Conversely, Dogan found unidirectional causality running from FDI to economic growth in Zambia from 1970 – 2011. We also note that Nyambe methodological weakness. We suggest the ARDL Bound testing technique would have provided reliable output as some of Nyambe's study variables were stationary at levels and first difference. Recently, a study by Libande et al. (2017) provided qualitative evidence on the FDI and economic growth relationship in Zambia. Libande et al. collected needed primary data from fifteen own foreign firms operating in Zambia. Twenty local employees were randomly contacted to fill in the questionnaire survey. Libande et al. analysis involves the use of chart and percentage. From their study, we found that FDI did not benefit the Zambian economy. Employees were paid less for labour, poor working and continuous late payment was cited as factors affector employees' productivity. Libande et al. concluded that FDI in Zambia did not contribute to the reduction of income poverty and subsequent, leading to a decline in economic growth through lower employees' productivity.

Gizaw (2015) investigated the effect of FDI on economic growth in Ethiopia from 1974 –

2013 and uses RGDP per capita as a proxy for economic growth. From Gizaw study, the relationship among variables was captured using the Johansen cointegration test. VECM method provides results pertaining short-run effect on FDI on Ethiopian economic performance. Gizaw reported that although Ethiopian did not benefit from FDI in the short- run, that FDI has resulted in improvement of economic performance Ethiopia in the long-run.

Belloumi (2014) study, which involves examining the effect of FDI on the economic growth of Tunisia from 1970 – 2008 found that FDI did not contribute to the economic growth of Tunisia. Belloumi uses RGDP per capita as a proxy for economic growth and applied ARDL and Bound testing to capture relationship among variables. Belloumi empirical report based on Granger Causality output shows no presence of causality running from FDI to the economic growth of Tunisia.

Mawugnon and Qiang (2011) adopted the pairwise Granger Causality test to capture the effect of FDI on economic performance (i.e., GDP) of Togo from 1991 – 2009. We observed weakness in Mawugnon and Qiang study. Considering the study period from 1991 – 2009, it is too short for time series study to provide reliable output. We also found similarity in Mawugnon and Qiang empirical results to that of Gungor and Ringim (2017) study where Gungor and Ringim examined the effect of FDI on the economic growth of Nigeria. Both studies found unidirectional Granger causality running from FDI to economic growth.

In the year 2001, Obwona found a positive association between FDI and economic growth of Uganda form 1981 – 1995. Obwona applied Two-Stage-Least-Square estimation technique and proxy economic growth of Uganda by annual GDP growth rate. Obwana reported that a unit increase in the FDI from 1981 – 1995 led to the improvement of the economic performance of Uganda by 0.172 units. However, the effect of FDI on economic growth, although positive but insignificant. We believe insignificance of the FDI effect on economic growth could be explained by Uganda's weak absorptive capacity and maybe a small volume of FDI received by the country during the study period.

3.2.2 Empirical literature review on growth (Panel Data studies)

In the year 2019, Asamoah et al. study looked at the contribution of FDI on the economic growth of thirty-four SSA economies from 1996 – 2016. Asamoah et al. stated that they adopted Structural Equation Modelling to quantify FDI effect on economic growth during the study period. By using RGDP per capita as a proxy for economic growth, Asamoah et al. empirical result show a unit increase in FDI to the thirty-four SSA economies significantly resulted into reduction of economic growth by 0.024 units. A similar result was echoed in Alege and Ogundipe (2013), which found that FDI insignificantly reduces economic growth of ECOWAS countries from 1990 – 2011.

Olabisi and Lau (2018) also studied the effect of FDI on the economic growth of twenty-three SSA economies from 1980 – 2016. They author proxy economic growth by RGDP per capita. We observed that cointegration among variables was captured through Johansen fisher panel cointegration test and Westerlund panel cointegration test, with a result indicating the presence of long-run relationship among variables. Olabisi and Lau adopted Pooled Mean Group (PMG), Common Correlation Effects Group (CCEMG) and Dumistrescu-Hurlin (2012) Granger Causality test. Based on results from PMG and CCEMG, we found a significant positive effect of FDI on the economic growth of twenty-three SSA economies. However, based on the magnitude of estimated coefficients, PMG performed better than CCEMG. Furthermore, Olabisi and Lau reported bidirectional Granger causality for nineteen countries, whereas unidirectional Causality running from FDI to economic growth in countries such as Nigeria, Comoros, Gambia, and Senegal were present.

Jilenga and Helian (2017) examined the role of FDI on the economic performance of thirty- six SSA economies from 2001 – 2015. The growth rate of RGDP per capita was used as a proxy for economic growth. Jilenga and Helian adopted FEM and GMM to achieve their research objective. We observe the similarity of results from FEM and GMM. In other words, both FEM and GMM empirical estimates show that FDI significantly reduced the economic performance of SSA countries understudy. However, the results from GMM were much higher (showing a greater negative effect of FDI on growth). Unsurprisingly, Jilenga and Helian studies show that FDI has a significant positive effect on the economic growth of the thirty-six SSA economies in the presence of institutional quality.

In 2016, Jugurnath et al. and Agbloyor et al. both investigate the effect of FDI on the Sub- Sahara African (SSA) economies from 2008 – 2014 and 1996 – 2010 respectively. The Jugurnath et al. and Agbloyor et al. studies both used GDP per capita growth and GDP per capita as a proxy for economic growth, respectively. Moreover, Jugurnath et al. panel data study was collected from thirty-two countries and adopted POLS, FEM, REM, and DGMM. In Agbloyor et al. study, forty-two SSA countries were involved and adopted SGMM. We found that, although FDI positively influenced the economic performance of SSA economies understudy, Jugurnath et al. estimation found FDI to have a significant effect on economic growth of thirty-two SSA economies compared to Agbloyor et al. For instance, Jugurnath et al. (2016) results from POLS, REM and GMM shows that effect of FDI on economic growth was highly significant.

Zhang et al. (2014) studied the role of FDI on the economic performance of twenty-two SSA economies from 2003 t0 2010. Zhang et al. proxy economic growth of these twenty-two countries by GDP per capita and adopted DGMM estimation technique. The empirical output shows suggest FDI from the rest of the world or FDI from China significantly improved the economic growth of twenty-two SSA economies during the study period.

Adams (2009) explored the effect of FDI on the economic performance of forty-two Sub-Sahara African (SSA) economies from 1990 – 2003. To capture the effect of FDI on economic growth measured as the RGDP growth rate, Adam adopted POLS and FEM estimation techniques. Adams reported that from 1990 – 2003, the SSA countries significantly benefited from the FDI. We observed from Adams' estimation that a unit increase in FDI during the study period resulted into economic growth of 0.155 units and that the effect of FDI on the economic growth of these forty-two countries was powerful. Similarly, in the year 2008, Ndikumana and Verick also examined the effect of FDI on the thirty-eight SSA economies from 1970 – 2005. Just like Adams study, Ndikumana and Verick also adopted FEM as their estimation technique and use GDP growth rate as proxy economic growth. Ndikumana and Verick concluded that FDI benefited the thirty-eight SSA economies during the study period and that they should design policies to attract more FDI.

Alege and Ogundipe (2013) studied the effect of FDI on the economic growth of the fifteen ECOWAS member countries from 1990 – 2011. Alege and Ogundipe used GDP per capita as a proxy for the economic performance of ECOWAS countries. They adopted the System Generalised Method of Moments (SGMM) estimation technique as they said would help control for endogeneity problem in the dynamic panel data study. Moreover, they pointed out that SGMM also eliminates unobservable heterogeneity. We observed that other estimation techniques, such as FEM, REM, POLS. Alege and Ogundipe reported that the effect of FDI on

economic growth was insignificant. Besides, we found the result from GMM suggest FDI had a negative but insignificant effect on economic growth (moreover, Alege and Ogundipe analysis of FDI and economic growth relationship is based on GMM estimation). Orji et al. (2014) conducted a regional study to examine the influence of FDI on the economic performance of the West African Monetary Zone (WAMZ) from 1981 – 2010. They reported that WAMZ comprises of five countries, namely; Nigeria, Ghana, Liberia, Gambia and Sierra Leon. Orji et al. proxy economic growth of the WAMZ by GDP and adopted Seemingly and Unrelated Regression (SUR) OLS and simple OLS. Orji et al. noted that using SUR OLS was due to the weakness of simple OLS estimation technique which results into estimations that are biases and inconsistent because error term is contemporaneously correlated which is likely to occur in a cross-sectional study. The result from SUR OLS and simple OLS estimation technique suggests that member countries of the West African Monetary Zone benefited from FDI during the study period. However, the effect of FDI on the economic performance of these WAMZ member countries was weak except for the Nigerian economy. We believe that Nigeria could have received a large volume of FDI compared to smaller economies like the Gambia and Sierra Leon, thereby, resulting in FDI have a significant effect on the economic growth of Nigeria.

Suleiman et al. (2013) also studied the effect of FDI on the economic performance of the South Africa Customs Union from 1980 – 2010. The custom union comprises of Five southern African countries. Suleiman et al. uses RGDP as a proxy for economic growth and adopted Dynamic Ordinary Least Square estimation technique to capture the effect of FDI on growth. Before conducting estimation, Suleiman et al. applied Pedroni panel cointegration test to ensure variables understudy are cointegrated. From Suleiman et al. empirical results, we observe that FDI has benefited the SACU region. The large volume of FDI might also explain the positive effect that member countries within the union receive; moreover, it could also be due to developed absorptive capacity present in the SACU such as human capital and developed infrastructures like roads and energy infrastructure.

Mahembe and Odhiambo (2016) and Bezuidenhout and Naudé (2008) both explored the contribution of FDI on the economic performance of SADC from 1980 – 2012 and 1970 – 2005, respectively. Mahembe and Odhiambo study involves fifteen SADC members countries, and they adopted RGDP as a proxy for economic growth. On the other hand, Bezuidenhout and Naudé reported that twenty SADC member countries were used to investigate the effect of FDI on growth and that GDP was adopted as a measurement for economic growth. We observed that Bezuidenhout and Naudé study which utilised Pairwise Granger causality test indicates that FDI has benefited the SADC region by supporting the economic performance of the SADC member countries. Conversely, Mahembe and Odhiambo study involves

dividing sample study into low-income panel group and middle- income panel group. Mahembe and Odhiambo test for panel cointegrated only found existence of panel cointegration for SADC middle-income countries. Therefore, Mahembe and Odhiambo applied VAR framework technique for low-income countries and VECM framework applied for the middle-income group. Mahembe and Odhiambo reported no causality in either direction for the low-income group while for the middle-income group; there was a presence of unidirectional Granger Causality running from RGDP to FDI. We conclude based on Mahembe and Odhiambo empirical results that FDI did not contribute to the economic growth of the fifteen SADC member countries irrespective to income groupings.

In the year 2016, Adams' et al. and Trojette, including Nahed et al. have all examined the role of FDI in improving the economic performance of African countries. Adams' et al. study period ranges from 1981 – 2010 and covers twenty-five SSA economies. Nahed et al. study looked at the effect of FDI on the economic growth of four North African countries (study period 1980 – 2013). Trojette empirical exercise takes the form of regional study from 1984 – 2013. Trojette investigated the effect of FDI on the economic performance of eighteen SSA economies, Asia, Europe and the Middle East and North African (MENA) countries. Adams' et al. and Trojette uses GDP and investment rate as % GDP, respectively. While Nahed et al. adopted real GDP per capita as measure for economic performance. Trojette (2016) and Nahed et al. (2016) adopted the system GMM estimation technique while Adams' et al. (2016) uses the Pooled Mean Group (PMG) estimation method.

Adams' et al. and Nahed et al. studies suggest that FDI has benefited the host countries. Adams also found that FDI was highly influential in supporting the economic performance of the twenty-five SSA economies both in the short and long-run. In our analysis, Trojette studies show that the FDI had a significant adverse effect on economic growth. However, in the presence of institutional quality, Trojette reports that FDI supports economic growth. In that, a unit increase in FDI resulted in a significant effect on growth by 0.480 units.

Urgaia (2016) and Zekarias (2016) studies all focused on Eastern African countries. They explored the effect of FDI on the economic growth of East African countries from 1970 – 2015 and 1980 – 2013, respectively. Urgaia(2016) and Zekarias(2016) all found that FDI contributed to the economic performance of Eastern African economies. Urgaia(2016) found FDI to have a more significant impact on economic growth. In terms of methodological application, Urgaia(2016) uses dynamic panel ARDL, time scale wavelet decomposition and RGDP proxy economic growth of the seven economies. The result was that FDI significantly benefited these seven countries both in short, medium and long run.

Conversely, Zekarias(2016) adopted SGMM and DGMM and adopted a yearly growth rate of

RGDP per capita as a measurement for the economic performance of fourteen East African economies. Seiko found FDI barely had a significant positive effect on economic growth. Moreover, Seiko study suggests that EAC dummy had an insignificant negative effect on growth.

3.3 Methodology and Empirical results

Our methodology and empirical chapter provides operationalization and discussion of our empirical results guided growth theory and end empirical reviews. In this section, we discussed our conceptual framework which guides our understanding on how FDI affects economic growth in the EAC region. We adopted Solow (1956) growth theory as a basis for our empirical analysis. We utilised difference Generalised Methods of Moments (DGMM) to quantify the effect of FDI on growth. In this section, we provided the table that reflects variables used in the study. Given that we looked at the overall effect of FDI on the economic growth of the EAC region, our empirical analysis is guided by macro level empirical reviews.

Therefore, we started by discussing our analytical framework as seen below (section 3.3.1)

3.3.1 Conceptual Framework on the FDI – Growth nexus

To capture the effect of FDI on economic growth in the East African Community (EAC) region, we applied the Solow (1956) growth model. The model assists us to understand the process of income and FDI convergence. The preference for the Solow growth model as our analytical framework is based on its simplicity, easy to apply and its breadth. Therefore, the model forms the basis for analysis effect of FDI on economic growth, in addition to exploring the income and FDI convergence in the EAC region. The importance of the economic model is that it allows us to control for other variables deemed in driving economic growth and attracting FDI to the EAC region.

Therefore, the advantage of Solow (1956) growth model (i.e. exogenous growth theory), many scholars that studied the effect of FDI on economic growth in Africa adopted the economic model as their analytical framework.

The Solow growth model suggests that investment capital improves the country's economic performance. In that, it increases the use of initially ideal resources. It is thereby increasing the country's national output. In the context of our study, the increase in the investment capital from foreign investors (i.e., FDI) is expected to increase economic activities of the EAC member states.

Based on Solow's theory of the diminishing return to capital, we assume that the effect of FDI on economic growth in the EAC region increases, but at a diminishing rate. In other words, as the EAC region continuous to receive FDI, the economic benefit (i.e., increase output) associated with

a rising increase investment decline over time. The fall in productivity of investment capital is due to increase in capital-labour ratio. According to Solow (1956) growth theory, as more FDI capital goes to the EAC region, the productivity of foreign capital falls as result of diminishing return to capital. Therefore, in the long-run the EAC region reaches its steady state equilibrium. In context of the EAC region, Solow (1956) stated that the region would achieve a "steady-state growth path", as result of variables such as capital; labour and output are all growing at the same rate. Thereby, creating a scenario where capital per worker/employee and per worker output is constant.

When the EAC region reached steady equilibrium path, any additional investment (both foreign and domestic capital) would simply replace depleted investment capital (i.e. depreciated capital). So, at this steady state equilibrium, any variation growth rates in the EAC region with the rest of other African regional groups such as ECOWAS (Economic Community of West African States) or SADC (South African Development Committee) will be based on pace technological change between the EAC region and the ECOWAS or SADC.

Looking at the contribution of FDI to different sectors of the EAC regional economies, Solow (1956) growth model suggests that, the regional sectors that receives more FDI would witness a higher level of output. And that the productivity of foreign direct investment is much greater in sectors of the EAC region, which possessed lower capital stock per worker. For instance, based annual report from Bank of Uganda, and National Bank of Rwanda, given that most FDI goes to service sector followed by manufacturing sector. We expect FDI to be more beneficial to agricultural sector due to lower capital-labour ratio. However, Solow (1956) argues, in the long-run, the sectoral productivity of foreign capitals would remain equal when all different sectors of the economic reach their steady state equilibrium state. Therefore, difference in the long-run growth rate of service, manufacturing and agricultural sector in the EAC region would be explained by technological advancement. In turn, the fastest growing sector would account for larger percent of the GDP in the EAC region–hence explaining how the growth rate of different sectoral output has influence of the overall economic performance of the EAC region.

We can see a direct link between the effect of sectoral output and the overall influence on the country's economic growth. In other words, in the EAC region, the sector with greater output as a result of a higher volume of FDI received would account for a more significant share of national output, hence such sector driving economic growth of the EAC region.

Moreover, under the Solow growth model, the concept of a diminishing rate of return also helps us to understand the process of income and FDI convergence in the EAC region.

The idea is that as FDI flows to Kenya, in the productivity of the investment capital decreases in

the long run as Kenya consistently continue to receive a large volume of FDI. It is subsequently leading to declining in the economic growth of Kenya overtime – resulting in income convergence in the EAC region.

Furthermore, seeking a higher return to investment (i.e. greater profits) guides foreign investors' decision making. Countries that offer such benefits attract foreign investment. In the context of the EAC region, a rate of return on foreign investment decline in Kenya, Multinational Corporations (MNCs) in the FDI will seek alternative countries with the EAC region which guarantee a higher return on investment. Meaning poorer EAC member countries will receive more FDI inflows than Kenya, therefore, resulting in FDI convergence in the EAC region. In other words, the EAC region wills catch-up with the rest of the developed countries both in term of income and share of FDI.

Therefore, to empirically determined the effect of FDI inflows in on economic growth in the EAC community member states, we followed Borensztein *et al*. (1998) and Adams and Opoku (2015) by presenting our empirical equation (3.3) seen below.

$$Y_{it}=\beta_0 + \beta_2 FDI_{it} + \beta_3 LF_{it} + \beta_4 H_{it} + \beta_5 DI_{it} + \beta_5 A_{it} + \beta_6 FDI_{it} * A_{it} + \mu_i + \varepsilon_{it} \qquad (3.3)$$

Where Y_{it}denote GDP per capita of the EAC member countries (i.e. Uganda, Kenya, Tanzania, Rwanda and Burundi) in period t, while t stands for the study period from 1970, 1971…..2017. Furthermore, $\mu_i$capture the unobserved country-specific time-invariant effect. The parameter β denotes regressor's coefficients of estimates, ε_{it} is the error terms. FDI stands for foreign direct net inflows (% GDP). LF and HC is the factor of production comprising of the labour force and human capital, respectively. With DI representing a domestic investment and A is a vector of control variables namely; policy variables, institutional and political risk variables.

$FDI_{it} * A_{it}$captures the interaction between FDI and control variables. These vectors of control variables are usually included in the growth model. It is assumed that they influence in the country's economic performance when one is studying FDI-growth relationship (Adams and Opoku, 2015; Borensztein et al., 1998),

In this study, the policy variable**s** comprise of government consumption, exchange rate instability, inflation rate, financial development, and trade openness, human capital, domestic investment.

Institutional quality variables are made of infrastructure, aid and technology gap while political risk and civil liberty represent political risk variables.

By following the working of Adams and Opoku (2015), Hermes and Lensink (2003), and Borensztein et al., (1998), we included interaction term in the model specification in order to

capture the degree to which FDI inflows and vectors of control variables (i.e. institutional quality variables and policy variables) and affects economic growth of EAC member countries. For instance, Adams et al., (2015) found that the presence of institutional quality in the SSA economies supports the effect of FDI on the country's economic growth. Moreover, Herms and Lensink (2003) also noted that the presence of financial development and human capital reinforce the effect of FDI on the economic growth of the developing countries. Similarly, Borensztein et al. (1998) found that human capital and FDI jointly have a positive effect on the country's economic performance.

Therefore, the interaction of FDI with the control variables enables us to determine whether or not these variables support the contribution of FDI in promoting economic growth in EAC member countries. We applied the difference generalised method of moment (DGMM) in the growth model. DGMM control for endogeneity in the model and removes unobserved individual country effects. Therefore, model (3.3) is converted into the model (3.4) as seen below.

$$\Delta Y_{it}=\beta_0 + \beta_1 \Delta FDI_{it} + \beta_2 \Delta LF_{it} + \beta_3 \Delta HC_{it} + \beta_4 \Delta DI_{it} + \beta_5 \Delta A_{it} + \beta_6 \Delta FDI_{it} * A_{it} + \Delta\mu_i + \Delta\varepsilon_{it} \quad (3.4)$$

In equation (3.3), a change in $\Delta Y_{it}=Y_{it} - Y_{1-it}$, $\Delta FDI_{it} =FDI_{it} - FDI_{it-1}$, $\Delta LF_{it} = LF_{it} - LF_{it-1}$, $\Delta HC_{it} = HC_{it} - HC_{it-1}$, $\Delta DI_{it} = DI_{it} - DI_{it-1}$, $\Delta A_{it} = A_{it} - A_{it-1}$, and $\Delta\varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$.

More importantly, because $\Delta\mu_i = (\mu_i - \mu_i) = 0$, it is from here that the elimination of individual effect term occurs and so we obtained our equation (2.3) as seen below.

$$\Delta Y_{it}=\beta_0 + \beta_1 \Delta Y_{1-it} + \beta_2 \Delta FDI_{it} + \beta_3 \Delta LF_{it} + \beta_4 \Delta HC_{it} + \beta_5 \Delta DI_{it} + \beta_6 \Delta A_{it} + \beta_7 \Delta FDI_{it} * A_{it} + \Delta\varepsilon_{it} \quad (3.5)$$

Based on (3.4) equation, we note that unobserved country-specific time-invariant effect, in addition to all any potential time-invariant independent variables in equation (3.3) is eliminated. Moreover, the merit of using difference generalised method of moments (DGMM) in our panel data model also allow as to control for any potential of autocorrelation in the model. Besides, the serial correlation (i.e. autocorrelation) occurs when exogenous variable, say A_{it} (vectors of control variables) is correlated with the error term (i.e. present and past error term). In this case,we say our model suffers from endogeneity problem (Adams and Opoku, 2015).

Table 3.1 shows variables where our dependent variable is ratio tradeable output to the non-tradeable output and the key independent variable is FDI net inflows (% of GDP).

Variable	Definition	Measurement	Source
Manufacturing output	Manufacturing, value added (%GDP)	Tradeable output	World Bank national accounts data, and OECD national accounts data files
Agricultural output	Agriculture, value added (%GDP) output as	Tradeable output	World Bank national accounts data, and OECD national accounts data files
Service output	Service, value added (%GDP) output as	Service output	World Bank national accounts data, and OECD national accounts data files
FDIA	Foreign Direct Investment net inflows (% of GDP)	FDI inflows	World Bank, WDI database
GFCF	Gross fixed capital formation (% of GDP)	Domestic investment	World Bank, WDI database
HC	School enrollment, primary (% gross)	Human capital (skilled)	World Bank, WDI database
POPA	Population age 15 – 64 (% of the total population)	Labour force (unskilled)	World Bank, WDI database
Trade	Trade (% of GDP)	Trade Liberalization	World Bank, WDI database
Inflation	Inflation, consumer prices (annual %)	Macroeconomic instability	World Bank, WDI database
AID	Net Official Development Aid received per capita (Current US	Institutional quality	World Bank, WDI database

	$)		
Infrastructure	Fixed telephone subscriptions (per 100 people)	Telecommunication Infrastructure	World Bank, WDI database
CL	Civil liberty	Freedom status	Freedom House
PR	Political right	Freedom status	Freedom House
Technology gap	GDP per capita current us$	Technology gap between the EAC region and the US	World Bank, WDI database
Gov.	General government final consumption expenditure (% of GDP)	Tax Policy /Fiscal Policy	World Bank, WDI database

Source: The secondary data are obtained from the World Bank, OECD, and Freedom House.

Table 3.2 shows key variables and vectors of control variables (i.e., policy, institutional and political risk variables).

Key variables	Policy variables	Institutional quality variables	Political risk variables
- FD1A - Economic growth	- Inflation - Government consumption - Money supply - Trade liberalization - Technology gap - Domestic - investment - Human capital - Labourforce	- Aid - Infrastructure	- Civil liberty - Political right

Source: Own summary of the variables used in the study.

Table 3.3 below is summary of descriptive statistic for our growth chapter. The countries involves in the study were five (i.e. Uganda, Kenya, Tanzania, Rwanda and Burundi). When we consider our main variable of interest, we can visually see a positive relationship between FDI and economic growth. For instance, from 1970 – 2017, the mean value of FDI inflows to the five EAC member states is 2.49%. During the same period we can report that the mean value for individual income level was US$342.06. According to UNCTAD database (2019) which report FDI in both flows and stock, Burundi received the least amount of FDI in the region. In addition, World Bank, World Development Indicator database (2019) also shows that Burundi economic performance is worst among the EAC regional member countries, with per capita income level much lower in comparison to the regional member countries.

Table 3.3 shows descriptive statistics for the effect of FDI on Economic growth of the EAC region (macro level) for the study period ranging from 1970 – 2017.

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
CL	5.1667	5.0000	7.0000	3.0000	1.1116	240
FDIA	2.4940	0.3828	320.1000	-0.7978	20.6446	240
FISCAL POLICY	14.6977	14.5670	31.5730	6.9716	3.9747	240
FMD	21.4103	20.8476	43.2472	7.2878	7.9334	240
INFLATION	14.8237	8.3954	200.0260	-2.4059	24.6111	240
INFRAST	0.3355	0.2518	1.6510	0.0320	0.2814	240
HC	85.3335	82.5349	148.1242	21.5813	31.3817	240
PR	5.5792	6.0000	7.0000	3.0000	1.1724	240
TRADE	41.9558	41.6440	74.5734	16.9511	12.3304	240
AID	35.6064	33.4510	120.1219	1.4576	23.2387	240
GDPPC	342.0614	255.5377	1,507.8000	57.6353	256.1251	240
POPA	10,579,743	7,066,625	283,000,000	1,786,908	18,962,064	240
TECHNOLOGY	98.6535	80.6403	350.5943	24.2625	60.8487	240
GFCF	18.0393	17.4327	34.2518	2.7811	6.9175	240

Source: Own computation using EViews 8 (x64). Where Obs. reflect observation.

However, when we consider Table 3.4 below, which present descriptive summary statistics for the EAC region member states excluding Burundi, we can see that the mean value for regional FDI inflows have improved by 0.17% from 1970 to 2017. Unsurprisingly, the mean income level for the EAC region (i.e., Uganda, Kenya, Tanzania, and Rwanda) also improved by US$ 7. 61 during the study period. Also, the mean value for ratio tradeable output to non- tradeable output was 0.87% during the same year.

We also add that in addition to FDI, growth theories (both exogenous and endogenous theory) shows that any form of capital subject to sound macroeconomic management supports economic performance of developing countries. For instance, domestic investment and aid, which in this thesis we used as institutional proxy results to economic growth as they inject needed capital to utilise ideal resources.

Considering mean value for domestic investment, aid per capita and macroeconomic management (proxy inflation rate) for the five EAC region from 1970 to 2017, Table 3.3 shows that 18.04%, US$ 35.60 and 14.82% respectively. However when Burundi is excluded from the study, we found that the EAC region registered improvement in the domestic investment, Aid per capita and macroeconomic management by 0.58%, US$ 2.04 and inflation rate down from 14.82% by 3.25%. Moreover, Romer (1986) and Lucas (1988) suggest that countries open economies that trade with rest of the world can access valuable production techniques through trade, and that country's human capital is essential for creativity and innovation. Result from Table D1 and the Table 3.4 below shows that excluding Burundi, the EAC region improves in trade and human capital is 43.52% and
85.55% primary school enrolment respectively. Indicating that the region gains more by excluding Burundi. For instance, Trade openness and human capital (school enrolment) increase by 1.56% and 0.2% respectively. Therefore, Burundi might be seen as an outlier in the exercise. However, excluding Burundi from the study does to results into included variables will have significant effect on growth

Table 3.4 shows descriptive statistics for the ratio tradeable to non-tradeable output (i.e., sectoral output) on economic growth in the EAC region for 1970 – 2017.

Variables	Mean	Median	Maximum	Minimum	Observations
RATIOTRADEABLE	0.8772	0.8592	1.3209	0.6595	192
FDIA	2.6620	0.3625	320.1000	-0.0013	192
GFCF	18.6197	18.4139	34.2518	2.7811	192
HC	85.5547	86.0308	148.1242	21.5813	192
POPB	51.1834	51.3744	56.9000	46.9338	192
TRADE	43.5185	44.0735	74.5734	19.6842	192
INFLATION	11.5710	9.0474	45.9789	-2.4059	192
AID	37.6469	34.4793	120.1219	3.7463	192
INFRAST	0.3347	0.2675	1.6510	0.0320	192
CL	5.2292	5.0000	7.0000	3.0000	192
PR	5.6198	6.0000	7.0000	3.0000	192
TECHNOLOGY	99.7388	78.3059	350.5943	24.2625	192
FMD	22.5664	21.1646	43.2472	10.4976	192
FISCALPOLICY	15.4311	15.0154	31.5730	7.8192	192
GDPPC	349.6688	249.0857	1507.8000	57.6353	192

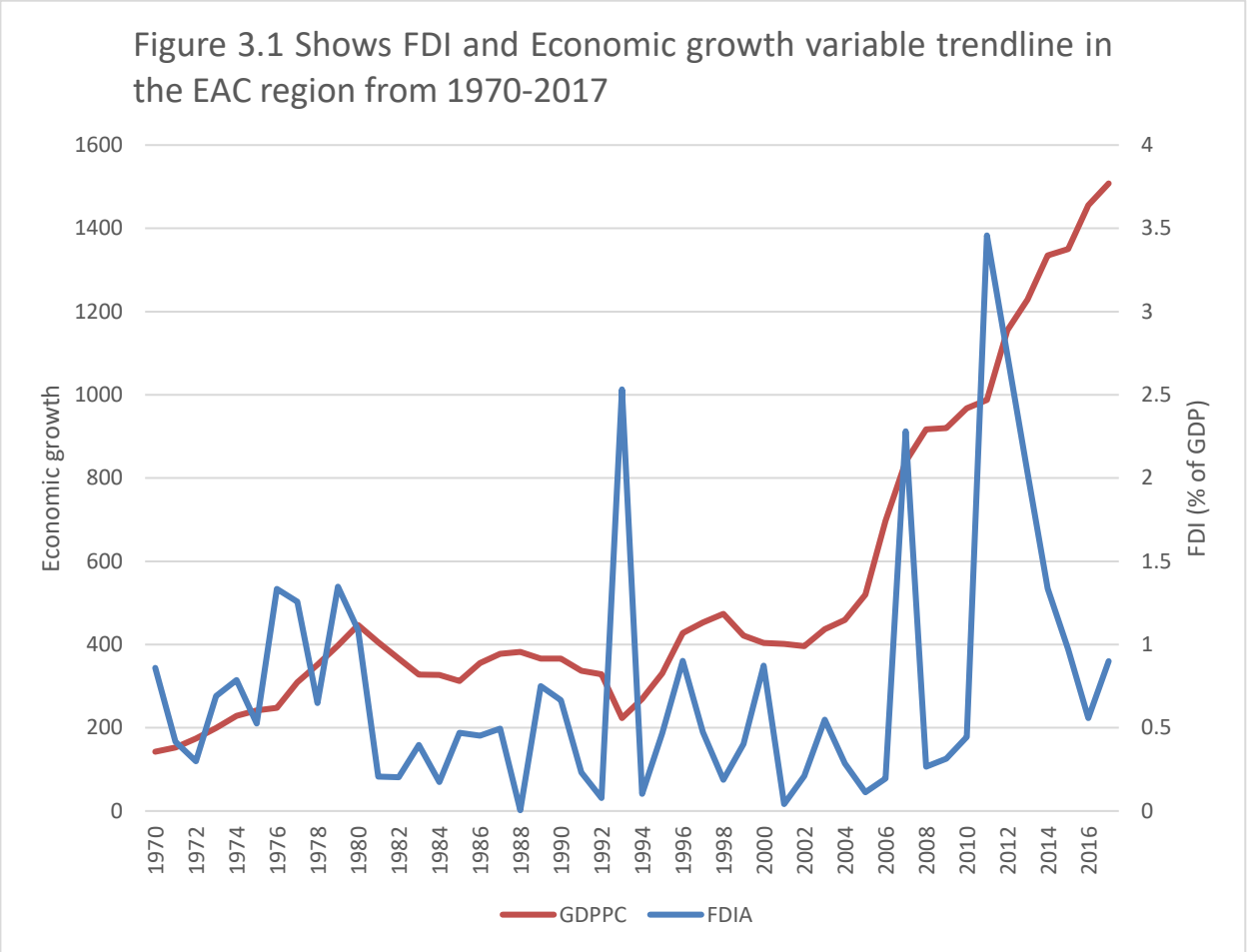
Source: Own computation using EViews 8 (x64)

Table 3.4 above shows that mean value of FDI is low, and to capture it effect on economic growth of EAC region empirically, we utilised Difference Generalised Method of Moments (DGMM) as seen in Table 3.6 below. The strength DGMM vis-à-vis POLS and FEM is that it controls for any potential endogeneity that might arise in the estimated model by using instrument variables. Moreover, in a dynamic panel data like our study, the GMM assist as to deal with simultaneity and unobserved heterogeneity in the sampled.

Therefore, for every estimating pertaining DGMM, we have provided information on instrument variables used. Our primary focus was to ensure that the right instrumental variables were used. We did so by testing the usefulness of the instruments variables using Sargan test. In addition, the advantage for GMM is that allow us to test for serial correlation in our dynamic panel dataset using Arellano-Bond Serial Correlation Test (m-Stat), test order AR (1) and AR (2).

However, we first started by presenting graphical analysis of trends in our key variables, in addition to examining the relationship between key variables based on scatter plots and trends. Report seen in figure 3.1 shows trendline for FDI and economic growth variable from 1970 to 2017. We observed that FDI variable trendline shows volatility overtime compared to economic growth varaible. In addition, the trendline for economic growth variable shows upward movement, with a steep rise around 2004.

Figure 3.2 is our scatter plot showing relationship between economic growth and FDI variable from 1970 to 2017. The linear trendline grapgh, displays both equation and R-squared value on the chart. This enables us to better understand nature of relationship between the two variables. Result from Figure 3.2 shows upward slopping trendline, indicating positive relationship between economic growth and FDI variable, with stronger relationship witnessed in the early studyperiod. R-sqared suggest that FDI only explains 1.3% variation in economic performnce of the EAC region. We argued that this could be as result of low volumeof FDI received in the EACregion during the study period. For instance, FDI net inflows (% of GDP) received in region was less than 3.5%. This might explain why FDI had zero effect on economic growth of the EAC regn during the study period. This is supported by empirical exposition reported in table 3.6 that shows FDI had zero effect on growth.



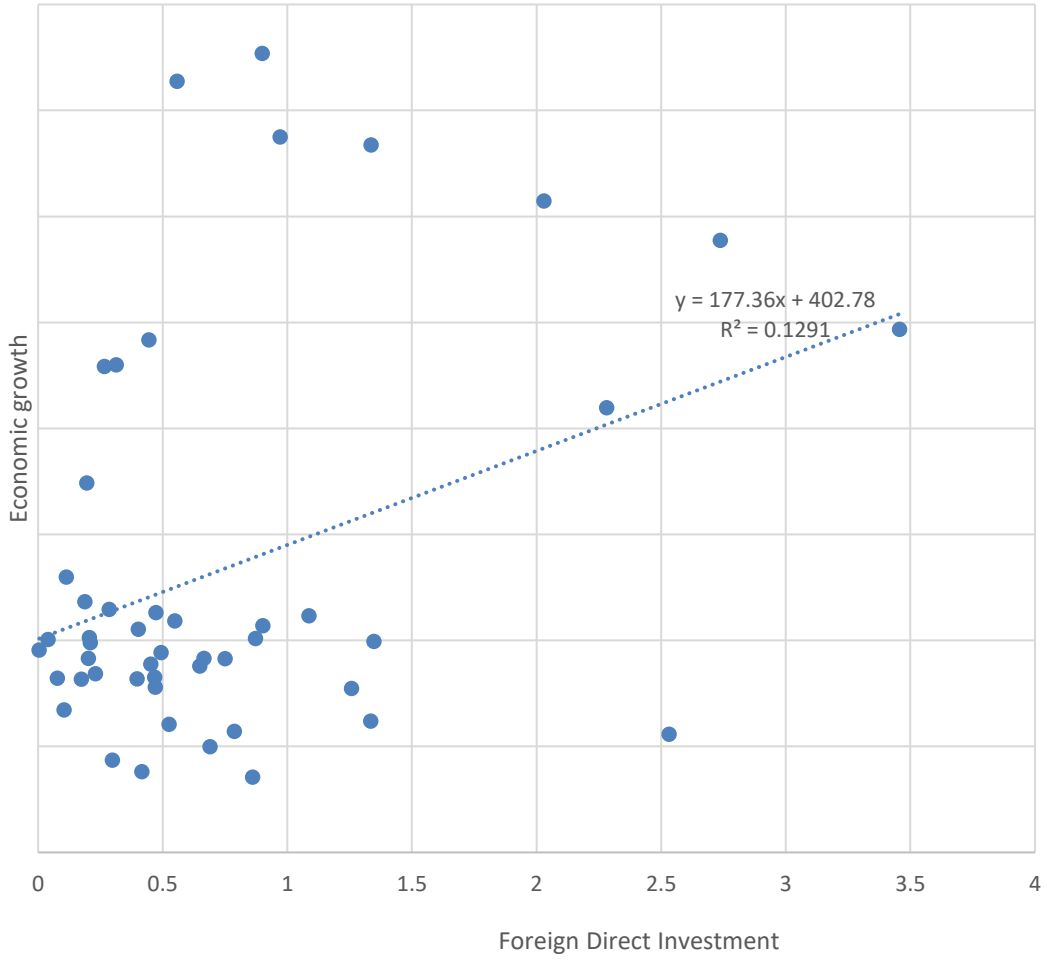
Source: Own computation using EViews 8 (x64)

Note:

FDIA – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

GDPPC – represent economic growth (measured as GDP per capita (current US$)) of the EAC region from 1970 – 2017.

Figure 3.2 shows the effect of FDI on economic growth of the EAC region from 1970 - 2017



Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Economic growth – represent economic growth (measured as GDP per capita (current US$)) of the EAC region from 1970 – 2017.

Table 3.5 shows instrument specification model for the effect of FDI on Economic growth of the EAC region (macro level study) for the study period ranging from 1970 – 2017. The model specification ranges from model 1 – model 10 (see Table 3.6).

Model	Instrument model specifications
1	LGDPPC(-1) FDIA(-1) LGFCF(-1) LHC(-1) LPOPA(-1) LFMD(-1) INFLATION(-1) LTRADE(-1) INFRAST LAID LTECHNOLOGY LPR LCL(-1) LFISCALPOLICY
2	LGDPPC(-1) FDIA(-1) LGFCF(-1) LHC(-1) LPOPA(-1) LFMD(-1) INFLATION(-1) LTRADE(-1) INFRAST LAID LTECHNOLOGY LPR LCL
3	LGDPPC(-1) FDIA(-1) LGFCF LHC LPOPA(-1) INFLATION INFRAST(-1) LPR FDIA*LGFCF(-1)
4	LGDPPC(-1) FDIA(-1) LGFCF LHC(-1) LPOPA(-1)FMD LTRADE LFISCALPOLICY(-1) LTECHNOLOGY LCL(-1) FDIA *LTRADE(-1)
5	LGDPPC(-1) FDIA(-1) LGFCF LHC(-1) LPOPA(-1)FMD LTRADE INFRAST LFISCALPOLICY(-1) LTECHNOLOGY LCL(-1) FDIA*LGFCF(-1)
6	LGDPPC(-1) FDIA LGFCF LHC LPOPA(-1) FMD LTRADE(-1) INFRAST(-1) LTECHNOLOGY(-1) LFISCALPOLICY LCL(-1) FDIA*LHC(-1)
7	LGDPPC(-1) FDIA LGFCF LHC LPOPA(-1) LTRADE INFRAST(-1) LFISCALPOLICY LCL(-1)
8	LGDPPC(-1) FDIA(-1) LGFCF LHC LPOPA(-1) LFMD INFLATION LTRADE(-1) INFRAST LAID(-1) LTECHNOLOGY(-1)
9	LGDPPC(-1) FDIA(-1) LGFCF(-1) LHC(-1) LPOPA LFMD INFLATION LTRADE(-1)
10	LGDPPC FDIA(-1) LGFCF(-1) LHC(-1) LPOPA(-1)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

3.3.3 FDI – Growth nexus Empirical results

In this section, we provided our empirical evidence on the effect of FDI on the economic performance of the East Africa Community (EAC) as seen in Table 3.6 below. The Table comprises of ten estimated models using difference GMM.

Table 3.6 shows the effect of FDI on economic growth (aggregate-level study) from the year 1970 – 2017.

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
FDIA	0.0019	0.0021	0.5675	0.2647	0.1957	0.1442	-0.0001	0.0013	-0.0001	0.0128
	(-0.6444)	(-0.6267)	(-0.3198)	(-0.7461)	(-0.7353)	(-0.6497)	(-0.9227)	(-0.6300)	(-0.9882)	(-0.5281)
LGFCF	0.3948	0.4314	0.4216*	0.0501	0.1096	0.2623	0.2239*	0.0017	1.2039**	4.1272**
	(-0.2928)	(-0.2828)	(-0.0993)	(-0.8228)	(-0.7240)	(-0.0695)	(-0.0148)	(-0.9873)	(-0.0428)	(-0.0021)
LHC	0.3767	0.4098	0.0885	0.2408	0.2719	0.2279	0.1918	-0.1800	0.2664	0.6625
	(-0.1958)	(-0.1788)	(0.6043)	(0.5888)	(0.5208)	(0.3273)	(0.2962)	(-0.3159)	(-0.5556)	(-0.5834)
LPOPA	0.7653***	0.7399***	0.8684***	1.0736***	1.0431***	0.9443***	0.8733***	0.6793***	-0.0107	-1.3518
	(-0.0011)	(-0.0026)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(-0.9328)	(-0.2271)
LFMD	0.2312	0.2487		-0.0006	0.0002	-0.0184		-0.2262	-0.5234	
	(-0.6231)	(-0.6166)		(-0.9232)	(-0.9727)	(-0.2493)		(-0.2048)	(-0.0766)	
INFLATION	0.0011	0.0009	0.0000					-0.0001	-0.0008	
	(-0.5071)	(-0.5697)	(-0.9583)					(-0.8984)	(-0.5464)	
LTRADE	0.2901	0.3485		-0.0247	-0.0696	-0.0999	-0.4391***	0.2466	0.8832	
	(-0.4180)	(-0.3543)		(-0.9169)	(-0.6946)	(-0.8415)	(0.0000)	(-0.4669)	(-0.1779)	
LFISCALPOLI	-0.0713			-0.4493	-0.4296	-0.2649	-0.2617**			
	(-0.4752)			(-0.7458)	(-0.7604)	(-0.1128)	(-0.0352)			
INFRAST	-0.0161	-0.0349	0.2572		0.0611	0.0831	0.3272	-0.0462		
	(-0.8914)	(-0.7665)	(-0.6918)		(-0.8555)	(-0.9229)	(-0.6762)	(-0.7077)		
LAID	-0.0321	-0.0441						0.4404***		
	(-0.6717)	(-0.5849)						(-0.0016)		
LTECHNOLO	-0.9853***	-1.0059***		-0.8640***	-0.8631***	0.1540		-0.5881**		
	(0.0000)	(0.0000)		(0.0000)	(-0.0001)	(-0.6459)		(-0.0402)		
LPR	0.1612	0.1436	0.2147							
	(-0.3220)	(-0.4242)	(-0.1250)							
LCL		0.0257		0.1492	0.1678	1.0174	0.6247			
		(-0.8352)		(-0.8752)	(-0.8496)	(-0.1635)	(-0.3533)			
FDIA*LGFCF			-0.2014							
			(-0.3198)							

FDIA*LGFCF					-0.0696					
					(-0.7349)					
FDIA*LTRAD				-0.0733						
				(-0.7458)						
FDIA*LHC						-0.0295				
						(-0.6499)				
Total Panel	230.0000	230.0000	230.0000	230.0000	230.0000	230.0000	230.0000	230.0000	230.0000	230.0000
observation										
Period	46.0000	46.0000	46.0000	46.0000	46.0000	46.0000	46.0000	46.0000	46.0000	46.0000
included										
Cross-section	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
included										
Number of	14.0000	13.0000	9.0000	11.0000	12.0000	12.0000	9.0000	11.0000	8.0000	5.0000
instruments										
Sargan test J-	1.5879	1.1368	0.8036	0.0056	0.0008	2.3939	2.5156	1.2835	0.3175	0.6739
	(-0.4520)	(-0.2863)	(-0.3700)	(-0.9402)	(-0.9776)	(-0.1218)	(-0.1127)	(-0.2572)	(-0.5731)	(-0.4117)
Arellano-Bond	0.1285	0.3120	0.2209	1.1524	0.4679	0.1774	0.7161	-0.6086	1.1763	-0.4445
Serial Correlation Test (m-Stat): Test Order AR(1)										
	(-0.8977)	(-0.7551)	(-0.8252)	(-0.2491)	(-0.6398)	(-0.8592)	(-0.4739)	(-0.5428)	(-0.2395)	(-0.6567)
AR(2)	0.0621	0.1792	1.0499	-0.0371	0.0525	0.8579	1.0369	-0.7680	1.0622	0.3103
	(-0.9505)	(-0.8578)	(-0.2937)	(-0.9704)	(-0.9581)	(-0.3909)	(-0.2998)	(-0.4425)	(-0.2881)	(-0.7564)
Wald Test	830.0579*	773.7363*	323.0782*	689.3749*	714.7053*	275.7892*	387.1199*	456.3811*	10.1692*	35.9577*
Chi-Square	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(-0.1792)	(0.0000)

Source: Own computation using EViews 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. The Sargan test of over-identifying restrictions is asymptotically distributed as χ^2 under the null of instruments validity. AR(1) and AR(2) are the Arellano and Bond (1991) tests for first- and second-order serial correlation in the differenced residuals, which are asymptotically distributed as a N(0,1)under the null of no serial correlation

From Table 3.6, across the model specification, the results show that FDI netinflows (%GDP) had zero effect on the economic performance of the EAC region from 1970 – 2017. According Insah (2013), FDI in Ghana took significantly longer period in order to have a significant positive effect on the economic growth of Ghana. In our study although FDI had zero effect on the economic growth on the EAC regions, the plausible explanation could be that the EAC region has low absorptive capacity (Borensztein et al. 1998) to utilize foreign technology. Hence the region witnessed zero FDI effect on the economic growth of the EAC region during the study period.

Our analytical framework, Solow (1965) growth model, it states that investment capital is positively associated with economic growth. Solow model suggests that substantial capital investment is required for a country to witness any significant economic growth. For the case of the EAC region, although FDI inflows support the economic growth of the region, its insignificance can be attributed to the low FDI inflows to the region.

We interacted FDI variables with domestic investment, trade liberalization and the human capital. We wanted to found out if FDI in the presence of themention variables (i.e. domestic investment, human capital and trade openness) would have any significant effect on growth. Our results shows that FDI netinflows (%GDP) had zero effect on the economic performance of the EAC region during the study period. This could be due to low absorptive capacity of variables such as human capital and domestic investment that exists in the region. For instance, huge technology gap between domestic investors and foreign direct investors meant that local investors could adopt and implement foreign technology spillover overs, which could have improved local investors' production process. Also, in situation where foreign investors subcontract some of their production to local investors, due to local human capital stock, it slows down their production.

Moreover, Sakyi et al. (2015) further noted that in the year 1970 – 2011, FDI in the presence of import had a detrimental effect on the economic performance of the Ghanaian economy. While in the presence of export, FDI significantly contributed positively to the economic growth of Ghana. Also, Sakyi et al. (2015) further interacted FDI and trade openness variable with FDI and concluded that FDI had zero effect on the economic growth of Ghana. Sakyi et al. (2015) argued that this could be due to limited availability of human capital that resulted zero to FDI effect economic growth.

Sakyi et al. (2015) result suggest that labourforce in developing countries are inadequately trained to use advanced foreign technology. According to Borensztein et al. (1998), only countries with well-developed human capital would benefit from foreign investment. So,

developing countries need to achieve a certain threshold on human capital in order to absorb foreign technology.

In the context of the volume of FDI in EAC region, consider UNCTAD data (2017) for the year 2017, it shows that FDI flows (US Dollars at current prices in millions) to EAC region amounted to the US $ 583.6777 million. It is indicating that 7.03% increase in FDI flows to the EAC region from the previous year. Moreover, in the year 2017, EAC regional GDP annual average growth rate per capita stood at 1.643%, with Tanzania and Rwanda recording for 3.866% and 3.576% respectively.

When we considered average FDI stock to the EAC region for the year 2017, data from UNCTAD (2017) indicate that the EAC region received US$9.24 billion. However, using FDI stock is misleading as it suggests the EAC region is receiving a lot of FDI. However, study on World Bank data (2017), which reports the country's FDI in terms of FDI, net inflows (%GDP). It suggests that the EAC region in the year 2017 on average only received 1.81%. Therefore, we argue that the insignificance of FDI inflows on the economic growth of the EAC region might be due to the small volume of FDI as % of GDP. Secondly, it could also be that the effect of FDI inflows takes a longer time to have any significant effect. Ndikumana and Verick (2008) reported similar results that the effect of FDI on growth takes long. For instance, Ndikumana and Verick's study shows that FDI took along to have a significant positive effect on the economic growth of thirty-eight Sub-Saharan African economies as of 1970 – 2005.

From a theoretical standpoint, Solow (1956) argues that Countries that receive a large amount of investment capital should grow much faster. In this context, Tanzania, which registered the most considerable amount of FDI flows among EAC member countries, also recorded the highest economic performance. For instance, in the year 2017, Tanzania received the US$1.18 billion and corresponded to GDP annual average growth rate per capita 3.89%. The data from the UNCTAD, thereby confirming FDI-economic growth nexus in the EAC region. Empirical studies on the contribution of FDI on the economic performance of African economies supports Solow's (1956) theory that FDI provides needed capital to propel economic performance. For instance, time-series studies have all found that FDI to have benefited the host economy. Adams (2009)'s panel data study also found FDI to have negatively affected the economic performance of the African countries from 1990 – 2003.

However, we found that the most time series studies pertaining contribution of FDI to economic growth African countries have found that African economies have benefited from FDI (Munyanyi, 2017; Jilenga et al. 2016). Conversely, Olokoyo (2012) reported that FDI to Nigeria did not support economic progress of Nigerian. In the context of panel data studies on FDI-growth

nexus in Africa, again we found evidence that FDI significantly contributed to the economic growth of African countries (Elboiashi, 2015; Mbuawa, 2015; Gui-Dlby, 2014, Suleiman et al. 2013). However, some panel studies suggest that FDI to Africa hurt economic growth (Klobodu and Adams, 2016; Adams, 2009).

Our study suggests that domestic investment played a significant role in the economic progress of the EAC region than foreign direct investment. For instance, across the entire model specification, model 3 and 7 suggest that domestic investment barely had any significant effect on growth. However, model 9 and 10 indicates that domestic investment was instrumental in supporting economic growth of the EAC region during the region period.
In other words, domestic investment is positively associated with the economic growth of the EAC region during the study period. From for instance, the specification model 9 and 10 indicate that, a unit increase in the improvement of domestic investment results into about 1.20 units to 4.13 units of increase economic performance of the EAC region and statistically significant. We attribute the positive effect of the local investment on economic growth come as result of using local intermediate resources in the production of goods and services. Moreover, due to demand and supply theory, manufactures only produce and supply products that are demanded by customers. In other words, local investors respond to customers' needs and want, resulting in efficient use of scarce local resources. Most empirical studies that incorporated local investment variable in their model found that local investment has contributed to the economic growth of the country under study (Elboashi, 2015; Sakyi et al. 2015). For instance, Adams (2009) found that domestic investments contributed more to the economic progress of forty-two SSA economy from the year 1990 – 2003.

For human capital, we found human capital to had zero influence on the economic growth of the EAC region. However, the due low-quality education system in the EAC
According to Boresztein et al. (1998) results, human capital can have meaningful contribution to the country's economic growth, however, a minimum threshold in human capital development needs to achieve in order for human capital to support economic growth in any country. Moreover, most studies suggest that human capital is associated with labour productivities. Therefore, high human capital reflects high labour productivity (Elboashi, 2015; Akinlo, 2004)

We also found that labour availability proxy by the total number of people age 15 – 64 years as % total population had a significant effect on growth. We, therefore, argue that the significant contribution of the labour force on the economic growth of the EAC region could be due to many people employed in productive economic activities. Secondly, in the context of the EAC region, most jobs are labour intensive and require little skills. For instance, farming, which is the most

significant employers, tend to employ low skilled workforce. As seen in Table 3.6, model specification model 4 and model 6, a unit increase in the labour force during the study period, have resulted in a significant improvement of the economic performance of the EAC region by the tune of units to 1.074 units and 0.679 units.

Moreover, most empirical studies on labourforce-growth relationship in Africa found that labour availability to play an instrumental role in promoting the economic growth of African economies (Suleiman et al. 2013, Akinlo, 2004). Furthermore, Akinlo reported that labour force had the most significant positive effect on the economic growth of Nigeria from the year 1970 – 2001. Akinlo's result concurred with our findings. We also found that labourforce had significant effect on economic growth of the EAC region during the study period.

Moreover, Epaphra and Mwakalasya (2017) also noted that the presence of labour force in Tanzania played an essential role in increasing agricultural production.

Furthermore, report from Table 3.6 indicates that the financial sector development varable had zero effect on economic growth of the EAC region. According to Elboiiashi (2015) and Asafu-Adijaye (2005) studies, they report that well-developed financial sector (proxy M2 % GDP) plays an essential role in support economic growth.

The importance of well-developed financial sectors stems from the idea that it facilitates fast payment of transaction (i.e. between buyer and seller). Also, well developed financial sector attract more savings due to trust in the financial system. Furthermore, well developed financial sector assists in channelling financial resources more effectively from lenders to borrowers, hence meeting the financial needs of the investors.

In context of the EAC region, underdeveloped financial sector thereby does not attract savers (creating shortgaes of funds for lenders). Financial sectors discouraging new servers could be due to relatively high administrative costs related to the opening bank account. Also, a high tax on saving seems to discourage savers. Besides, we note that the commercial banks tend to be in the urban or small trading centres hence acting as disincentives to savers residing in the rural area. Therefore, the resultant effect of the underdeveloped financial sector in the EAC region from 1970 – 2017 is decreased availability of loanable funds provided by financial institutions to borrowers. With regards to inflation, our empirical results show that inflation had zero effect on the economic growth of the EAC region during the study. From Tble 3.6, we can see that inflation variables across entire model specifications report that inflation had zero effect on growth. According to Tobin models (1965), it posits positive inflation-growth nexus. However, we note that high inflation discourages economic growth. In other words, it erodes investment assets values. Therefore, well-managed inflation supports economic growth. For example, most studies have found poor macroeconomic manage (proxy inflation) to have a detrimental effect on the economic growth of Africa (Adams, 2009)

Our studies also found that trade liberalization hinders economic growth of the EAC region. For instance, Table 3.6, model 7 shows that, for a unit increase in trade liberalization from 1970 – 2017 have resulted in a significant reduction to economic performance of the EAC region by 0.439 units for every additional increase of trade liberalization variable in the EAC region during the study period. Implying that trade openness might indirectly crow out domestic investments. The crowding-out of domestic investment could explain the plausible negative effect of trade liberalization on economic growth. As seen in Table 3.6, domestic investment plays a significant role in supporting economic growth. And this is because local investors tend to use local resource. However, due to trade liberalization, most goods that are locally produced can now be imported. Because locally made products are priced out of the local market by imported goods as imported quality products are superior to locally made goods. Driving domestic producers from economic activities results in loss of local jobs, hence harming economic performance of the EAC region during the study period. Suleiman et al. (2013) also found that trade openness did not benefit the SADC region from 1980 – 2010. However, most studies found that trade liberalization has contributed to the economic performance of African countries (Ndikumana and Verick, 2008). For instance, According to Elboiashi (2015), increase in FDI to developing countries, in the presence of trade openness resulted into the significant economic growth of the hosts' countries by 4.9% for the year 1970 – 2005.

Asafu-Adijaye (2005) and Makki and Somwaru (2004) reported that well-developed infrastructure (proxy by telecommunication infrastructure) had significantly benefited African countries. In context of our study, infrastructure variable had zero effect on economic growth. The state of poor existing infrastructure, in addition to infrastructure shortages in the EAC region could be due to persistent underinvestment in the infrastructure (proxy by telecommunication sectors) from 1970 - 2017.

In our study, we proxy our infrastructure by fixed telephone line, a proxy for infrastructure commonly used when studying economic growth of Africa (Asafu-Adijaye, 2005). Unfortunately, fixed telephone line usually located in urban centres where electricity supply is available. Moreover, using fixed telephone landline are more costly to customers compared to mobile telecommunication, which is widely used by the citizenry of the EAC region.

Therefore, zero effect of infrastructure varible on economic growth seems to be explained by fewer people using fixed telephone line as a mean of communication. The reason why fewer people using fixed telephone infrastructure seems to be cost related (i.e. fixed telephone line is expensive).

For instance, consider recent World Bank data for the last five years (2013 – 2017). The data involve average fixed telephone and mobile phone subscription (per 100 people) for the last five years. Our analysis indicates that mobile phone subscription (per 100 people) shows that the five years average mobile phone subscription (per 100 people) for Burundi, Kenya, Rwanda, Tanzania, and Uganda stood at 172.5007, 378.7414, 310.8951, 325.6733, and 250.9607 respectively, with Kenya accounting for the most mobile subscription. In terms of five averages, fixed telephone subscription (per 100 people). We found that in the last five years, the average fixed telephone subscription (per 100 people) for Burundi, Kenya, Rwanda, Tanzania, and Uganda stood at 0.9690, 1.7732, 1.4239, 1.5159, and 4.1350 respectively.

It can be seen that within the last five years, on average, there was more mobile subscription (per 100 people) than fixed telephone subscription (per 100 people). Table 3.3 result provides an insight as to why telecommunication infrastructure from 1970 – 2017 possessed mainly positive but insignificant estimates. Indicating that the availability of telecommunication infrastructure encourages economic growth in the EAC region.

In terms of government expenditures of (final expenditure on consumption as %GDP) , the result of our study based on model 7 in Table 3.6 suggests an increase in government expenditure would affect negatively the economic performance of the EAC region from the year 1970 – 2017. Quantitatively, a 1% increase would result in a significantly reduced economic growth of the EAC region by 2.62% during the study period.

According to Elboashi (2015) and Akinlo (2004), they both observed that countries with high government consumption tend to reduce economic growth of African economies. Their empirical findings support result. In our study, a plausible explanation for the negative effect of finanl government expenditure on consumption to the economic growth of the EAC region could be that government increase business tax into order to fund final government expenditure on consumption. Moreover, government consumptions such as importing military hardware do not support economics. Therefore, because most government consumption in Africa does not support domestic economic activities, most studies that accounted for government consumption in African have found it to harm economic growth (Gui-Diby, 2014). However, Moyo (2013) found that government consumption has benefited Zimbabweans economy from 2009 – 2012.

With regards to the technology gap, the finding in Table 3.6 shows that the technology gap has negatively affected the economic growth of the EAC region.

According to Blomström and Kokko (1998), technology spillovers from foreign irms to local firms depend on the absorptive capacity of domestic firms. They argued that developing countries with small technological gaps vis-à-vis those of FDI country of origin encourages the FDI related

technology spillovers and that large technology gaps impede technology transfers from foreign firms to local firms.This is because foreign investors' technology cannot compliment domestic production technology due to the low absorptive capacity of the local producers. In the context of the EAC region, the negative effect of technology gap means that the productive efficiency of local producers is lower compared to developed countries like the US. Therefore, it seems there is no optimal use of local resources from 1970 – 2017 due to low production technology in the EAC region. Result in Table 3.6, model 2 and model 8 indicates that decline in technology gap between the EAC region and those of the US results into the reduction of the economic performance of the EAC region by 1.001 units and 0.581 units, respectively.

For instance, the imported goods from the US is of high quality and costs effective compared to those of the EAC region. According to Lia and Liu (2005) empirical study, they noted that the technology gap had a significant adverse effect on the economic growth of developing countries from 1970 – 1999. In context of our study, technology gap had significant adverse effect on economic growth of the EAC region during the study period.

In our study, empirical evidence indicates that improvement of institutional quality from 1970-2017 benefited the EAC region. we use per capita aid as a proxy for institutional quality

According to North (1990), countries will well-developed institutions encourage private sector investment. In the context of the EAC region, an improvement in the institutional quality resulted in significant improvement in the economic growth of the EAC region by 0.440 units as seen in Table 3.6, model 8.

We used official development aid per capita as a measure for institutional quality. This is because development aid to Africa is attached to institution quality. Our empirical result gained support from previous studies. Jilenga et al. (2015) and Obwana (2001) found similar results in their studies. For example, Jilenga et al. (2015) and Obwana (2001) both found official development aid (ODA) to have positively contributed to the improvement of Tanzanian and Uganda economy, respectively. Also, Ezeji et al. (2015) found that ODA supported economic performance of Ghana, with exception Nigeria. According to Ezeji et al. findings, it seems to suggest that Ghana's institutions quality is fairly developed than Nigeria.

Our empirical results further show that political risk variable had zero effect on economic growth during study period. We proxy our political risk by civil liberty and political right. Political stability promotes economic growth by encouraging foreign investment capitals into the country. Also, it encourages domestic investment. For instance, Makki and Somwar (2004) study shows that countries that are politically stable tend record improvement in their economic activities, hence promoting economic growth.

This could be that countries that are political stability encourages political participation thereby, ensuring that government activities are under public scrutiny – resulting into waste elimination in both public and private sector. Most empirical papers reviewed conclude that political stability is positively associated with the economic performance. According to North (1990) theory, a country with strong but stable political rights and civil liberty tends to have good governance and strong institutions required to support economic activities of the economic agents. Moreover, civil liberties and political right tend to influence the application of property rights through government agencies and the address any trade disputes through the court system. Besides, they do ease the requirement for starting and owning businesses.

In summary, FDI netinflows (%GDP) to EAC region from 1970 – 2017 had zero effect on the economic growth of the EAC region. However, variables such as labourforce, trade openness, human capital, technology gap seems to have significant effect on economic performance of the EAC region during the study period.

3.4 The role of FDI on the sectoral output

Here we present discussion on the effect of the ratio tradeable output to non-tradeable output (i.e., sectoral study) on the economic growth of the EAC region from 1970 to 2017. The study period ranges from 1970 – 2017 and the country involved in the study includes Uganda, Kenya, Tanzania, and Rwanda. Burundi was excluded from the study due to lack of data. The period where data were available, the volume of sectoral output was small compare to the rest of the EAC member countries. Therefore, qualifying Burundi as an outlier, including Burundi in the study would affect the quality of our study.

In this section, we provided our empirical estimates and results. Moreover, we also provided brief concluding remarks and policy recommendation guided by our empirical result. We started with the discussion of the empirical literature on the role of FDI on agricultural sectoral output, and then followed by service and manufacturing output.

Moreover, we also provided Table showing our descriptive statistics and instrument variables used in our model specification.

Our theoretical model remains the same as seen above (refer to methodology and empirical results section 3.3)

3.4.1 The effect of FDI on the agricultural output

Owutuamor and Arene (2018**)** studied the contribution of FDI on agricultural sector in Nigeria from 1979 to 2014. They adopted different analysis such as trend analysis, Granger Causality test and OLS estimation technique. The data were collected from Central Bank of Nigeria, World Bank and USA Federal Reserve System. They reported that although in the short-run, result from Granger Causality test shows that FDI to agricultural sector significantly boost agricultural productivity of the sector as reflected in a drop of share of agricultural output to GDP, in the long-run, OLS estimation shows that FDI results in an insignificant fall of agricultural productivity in Nigeria during study period.

In the same year, Edewor et al. (2018) empirically assessed the contribution of FDI and other selected variable to agricultural productivity in Nigeria from 1990 to 2016. OLS estimation was adopted to quantify the effect. The result shows that a unit increase in FDI significantly undermined agricultural productivity. They attributed the significant negative effect of FDI to agricultural sector by a drop of FDI to the sector. For instance, they noted that Agricultural sector witnessed a significant drop of FDI to agricultural sector since 2014.

In the year 2014, Oloyede studied the impact of FDI on the agricultural sector in Nigeria

from 1981 – 2012. Oloyede applied OLS estimation technique and found that FDI has significantly contributed to the growth of the agricultural sector in Nigeria. We note that Oloyede estimation technique does not control for endogeneity in the model so the result might be unreliable. We also found similar results in Binuyo (2014) study covers the year 1981 – 2012. For example, in the same year, Binuyo applied similar estimation technique (multiple linear regression) and covering the same year to that Oloyede. Binuyo concluded that FDI in Nigeria had benefited the agricultural sector.

Moreover, Ogbanje et al. (2010) applied less sophisticated technology to examine the effect of FDI on agricultural sector in Nigeria from the year 1970 – 2007. Ogbanje et al. data were collected from the Central Bank of Nigeria and applied Pearson Moment Correlation (PMC) analysis and concluded that FDI had promoted the growth of the agricultural sector in Nigeria.

However, we also observed that some studies that looked at the effect of FDI on the agricultural sector in Nigeria have either found no significant or even negative effect of FDI in agricultural – this reduces the production of agricultural output. For instance, Akande and Biam (2013) studied the causal relationship between FDI and agricultural output in Nigeria from 1960 – 2008. Akande and Biam applied several statistical techniques such as Johansen co-integration procedure, Error Correction Method (ECM), in addition to Granger causality tests and impulse response. Akande and Biam found no relationship between FDI and agricultural output in the long-run, except short-run. Moreover, In the same year, 2013, Idowu and Ying (2013) conducted a study in Nigeria from 1980 – 2007 and applied vector Autoregressive (VAR) approach. From Idowu and Ying study, we note that FDI did not have any significant effect on the agricultural sector. A finding similar to that of Akande and Biam (2013).

We report that Akande and Biam (2013) and Idowu and Ying (2013) more reliable compared to Oloyede(2014) and Binuyo (2014) because it covers longer study period (Akande and Biam, 2013) and applied more advanced estimation technique.

Anetor (2019) investigated the impact of FDI in the agricultural sector from 1981 – 2016 in the Nigerian economy. Anetor utilised impulse response function, Variance Decomposition (VDC) of Vector Autoregressive (VAR). Besides, like Biam (2013), Anetor also applied VAR Granger Causality. Anetor results from VDC shows that FDI has a positive influence on the agricultural sector, although FDI exerts a more positive influence in the manufacturing sector. However, results from VAR Granger Causality suggest that FDI does not support the agricultural sector in Nigeria (Anetor, 2019). We note that result from Granger Causality Anetor (2019) and Akande and Biam (2013) indicate no relationship between FDI and the improvement of the

agricultural sector. Moreover, a study from Izuchuku et al. (2014) empirical results concurs with Anetor (2019), Akande and Biam (2013) and Idowu and Ying (2013) results that FDI does not support the growth of the agricultural sector.

For example, Izuchuku et a.l (2014) analysed the relationship between FDI and agriculture development sector in Nigeria by utilising data from 1980 – 2009. The VAR model involving three-step-procedure was adopted in the study. We found evidence of the relationship between FDI and agricultural sector development based on the result from Johansen and Juselius multivariate cointegration test indicate that there is a presence of cointegration. Granger causality test result shows that the variables employed have a bidirectional relationship. Moreover, Izuchuku et al. (2014) seem to indicate no that FDI does not Granger cause agriculture sector development. In other words, FDI although it has a relationship with agricultural sector development in Nigeria, however, it does not have any significant influence. We believe that the agricultural sector in Nigeria might be receiving less FDI compared to service or manufacturing sectors of the economy

Epaphra and Mwakalasya (2017) analysed the relationship between agricultural output, FDI and economic growth of the Tanzanian economy from the year 1990 – 2015. They applied multiple linear regression in their methodology. Epaphra and Mwakalasya found a statistically insignificant negative effect on FDI.

Iddrisu (2015) investigated the impact of FDI on the performance of the agricultural sector in Ghana from 1980 to 2013. They sourced their data mainly from World Bank. In order to capture short-run and long-run effect of FDI on agricultural sector of Ghana, they utilised Vector Error Correction Model (VECM). They reported that a unit increase of FDI to agricultural sector significantly result to a fall in agricultural productivity of 0.03 units in the long run. Conversely, in the short-run effect of FDI to agricultural performance of Nigeria is positive but insignificant. Iddrisu empirical result is support by Owutuamor and Arene (2018) on the sectoral effect of FDI in Nigeria 1979 to 2014. Furthermore, they report that the agricultural sector accounted for economic growth during the study period. Conversely, an earlier study by Msuya (2007) suggests that FDI exerted a positive effect on the agricultural sector. Furthermore, from their analysis, it appears that FDI played a significant role in promoting the growth of agricultural output than smallholders' farmer – attributing it to large scale production by foreign investors due to availability of investment capital at their disposal.

However, Zingwena (2014) supports Epaphra and Mwakalasya (2017) findings that FDI support promotes agricultural output. For instance, Zingwena (2014), which analysing data from 1980 – 2012 and applying Stock-Watson Dynamic Ordinary Least Square (DOLS) concluded that FDI

benefited agricultural sector of Zimbabwe. Zingwena studies indicate that FDI intensity in the agricultural sector is needed to further propel agricultural output in Zimbabwe.

Massoud (2008) obtained study data from the World Bank, the Central Bank of Egypt and the Central Agency for Public Mobilization Statistics. Massoud's study period ranges from 1974 – 2005 and applied instrumental variables by adopting Two-Stage-Least-Square (TSLS) estimation technique. Massoud reported that FDI in Egypt did support agricultural output because of low demand for labour in agriculture. Massoud empirical exercise also suggests that FDI hired more labour in the manufacturing and service sector and that in the presence of trade liberalization, FDI benefited manufacturing and service sector than the agricultural sector.

Salimane et al. (2016) and Alfaro (2013) both examined the effect of FDI on the agricultural sector of the host economies. Salimane et al. (2016) and Alfaro (2013) results indicate that FDI has negatively impacted the agricultural sector the host economies. In Alfaro sourced study data from the World Bank database, UNCTAD, OECD and International Direct Investment Statistics Yearbook (2011). Furthermore, Alfaro study period covers the year from1981 – 1991 and involves forty-seven developing and transition economies, with only two African countries (i.e. Nigeria and Tunisia). Alfaro concluded that although FDI supports economic growth at a macro level, that FDI influence on agricultural sector was negative, to a tune of 0.14 to 0.29. Alfaro asserts that this could be explained by little FDI going to the agricultural sector with a little spillover effect.

Along the same line, Salimane et al. in the year 2016 also reached a similar conclusion when investigating the effect of FDI on the agricultural sector of fifty-five countries and applying Three-Stage-Least-Square (3SLS) estimation technique. Salimane et al. argued that applying the Fixed Effect Model (FEM) and 3SLS technique helps to control for endogeneity problem in the model hence enabling them to provide a reliable outcome. We observed that result from their Salimane et al. study which covers the period of 1995 – 2009 and involved Asian, Latin American, Eastern European and African (i.e., Tanzania) countries found that FDI reduces agricultural sector output by about 0.4%.

We observed that even though Salimane et al. found a higher negative FDI of FDI on the agricultural sector than Alfaro, Salimane et al. noted that FDI influence on economic growth and food security was positive. We observed enough empirical evidence that FDI has a negative association with the agricultural sector. For instance, Basu and Gurigalia (2007) study which involve larger panel dataset consisting of one hundred and nineteen countries, with a more extended period of 1970 – 1999. Basu and Gurigalia results based on FEM and dynamic GMM shows that for a 1% increase in FDI results into reduction of agricultural output by 25.1% and

57.8% respectively. Basu and Gurigalia (2007) empirical results concurs with Salimane et al. (2016) and Alfaro (2013) results, which both found that FDI negatively affected the production of agricultural output.

Moreover, a study by Ulla et al. (2012), Chakraborty and Nunnenkamp (2008) and Khalinq and Noy (2007) all found FDI to harm the agricultural sector. For instance, Ulla et al. (2012) study based on Pakistan economy had a study period from 1979 – 2012 and applied 2SLS while Khalinq and Noy (2007) study based on Indonesian economy range from 1997 – 2006, and they reported that they had followed Vu et al. (2009) and Alfaro (2003). Khalinq and Noy involve twelve sectors of the economy and applied FEM. Similarly, Chakraborty and Nunnenkamp (2008) based their study on the Indian economy and their study period range from 1987 – 2000. Chakraborty and Nunnenkamp applied panel cointegration frame and Granger Causality because, according to them, it allows for heterogeneity that exists across fifteen industries across service, manufacturing and primary sector. We note that the Chakraborty and Nunnenkamp results show that there was a relationship between FDI and
productivity of the agricultural sector in India. Wang (2009) finding an effect of FDI on agricultural productivity for twelve Asian countries from 1987 – 1997 was ambiguous.

3.4.2 The effect of FDI on the manufacturing and service output

Agu and Okoli (2015) and Orji et al. (2015) both examined the effect of FDI on the manufacturing sector in Nigeria from the year 1970 –2013 and 19 70 – 2010 respectively. We observe that both Agu and Okoli and Orji et al. studies state that FDI in Nigeria during the study period have negatively impacted on the productivity of the manufacturing sector. For, instance Agu and Okoli applied both the ordinary least square and VECM technique, according to them it would enable them to capture both short and long-run effect of FDI on manufacturing output in Nigeria.

According to Agu and Okoli, there was no presence of a short-run relationship between FDI and manufacturing sector productivity, and they further pointed that from 1970 –2013, a unit increase in FDI accounted for a reduction in productivity of manufacturing sector by approximately 0.873 units. Similarly, Orji et al., which applied multiple simple linear regression also found that from 1970 – 2010, a unit increase in FDI to manufacturing sector resulted to a reduction of manufacturing productivity by 0.259 units.

The weakness of Orji et al. (2015) lies in its methodology as simple linear regression cannot control for endogeneity in the model. Moreover, we observe the presence of serial correlation in Orji et al.'s model as Durbin-Watson test statistic value is 1.41 (resulting to spurious estimates) below required 2.0 value which indicates no the model is free form autocorrelation problem

David et al. (2012) applied vector autoregressive (VAR), cointegration and error correction method to examine the effect of FDI on the manufacturing sector of Nigeria from 1975 – 2008. David et al. results show that FDI harmed the productivity of the manufacturing sector in Nigeria. A year later, Adejumo (2013) captured the effect on FDI on the manufacturing sector in Nigeria from 1970 – 2009 by utilising Autoregressive Distributive Lag testing (ARDL). Adejumo reported that during the study period, Nigeria's manufacturing sector productivity was negatively affected by FDI. Our interpretation of the David et al. (2012) and Adejumo's (2013) results that FDI hurt manufacturing sector might be explained by lack of productivity spillover in the sector because of low absorptive capacity. The low absorptive capacity could be due to the low human capital stock, poor infrastructure in the manufacturing as Nigeria economy was heavily dependent on oil export revenue.

In the same year, Umer and Alam (2013) exploited Johansen and Juselius cointegration test and VECM technique to identify the effect of FDI and trade liberalization on the industrial productivity

of Pakistan from 1960 – 2011. Umer and Alam empirical output shows that FDI has benefited the industrial sector of Pakistan. Umer and Alam (2013) result in conflict with those of David et al. (2012) and Adejumo (2013) which found that FDI resulted into reduction in output of Nigeria's manufacturing sector from 1975 – 2008 and 1970 – 2009 respectively. We believe that the difference in Umer and Alam and those of David et al. (2012) and Adejumo (2013) results might be explained by human capital study, sectoral infrastructure development (particularly energy infrastructure) and government policies towards supporting the manufacturing sector.

Chakraborty and Nunnenkamp (2008) study although did find any significant relationship between FDI and agricultural production in the Indian economy from 1987 – 2000, they, however, found a positive effect of FDI and manufacturing (secondary sector) and service sector (tertiary sector).

Posu et al. (2007) which applied ordinary least square estimation technique found that FDI benefited both service (i.e. telecommunication and transport sector) and the primary sector (particularly mining sector) of Nigeran economy from the year 1970 –2003.

Cipollina et al. (2012) study involve fourteen countries and applied the GMM estimation technique to examine the effect of FDI on the manufacturing sector from 1992 – 2004. Cipollina et al. further stated that they follow Alfaro and Charlton (2007) and Rajan and Zingales (1998) methodology GMM because it controls for endogeneity in the model. They reported that a 1% increase of FDI during the study period resulted in an increase of 30.6% productivity in the manufacturing sector and statically significant. Salimane et al. (2016) and Basu and Gurigalia (2007) which found that FDI positively benefited the manufacturing sector of the hosts economy. Besides, Cipollina et al. also observed that manufacturing sector propel the economic growth of fourteen countries under study.

Anowor et al. (2013) wanted to understand whether FDI in Nigeria from 1970 – 2011 benefited Nigeria's manufacturing sector by increasing manufacturing output. Anowor et al. applied the ordinary least squares estimation technique to achieve their research objective.
They found that FDI significantly benefited the manufacturing sector of the economy. We analyse Anowor et al.'s empirical and found that a unit increase in FDI to Nigeria from 1970 – 2011 increased manufacturing output by 0.470 units. We believe Anowor et al.'s might have spurious results because unit root tests show that export, degree of trade, domestic investment and FDI variables were a station at levels while manufacturing output was stationary at first difference. We suggest better estimation that would provide reliable results would have been ARDL, bound testing approach. Moreover, OLS, a technique does not control for endogeneity problem – also noted that export and trade degree might be highly correlated, and that estimated model suffers from serial correlation based on Durbin-Watson test statistical value of 2.32.

None the less, Anowor et al. (2013) findings concur with Adegboye et al. (2016) recent study that FDI supports the manufacturing sector.

Adejumo (2013) also investigated the effect of FDI on the manufacturing sector of Nigeria from 1970 – 2009. Adejumo applied ARDL proposed by Pesaran, Shin and Smith (2001, 1996) and noted that the ARDL technique suit data that are stationary at different levels. Adejumo results from ARDL –bounding testing shows that during the study period, there was the presence of a long-run relationship between FDI and manufacturing value addition variable. However, our observation based on Adejumo's empirical results is that FDI in Nigeria did not benefit manufacturing sector in the long and short run, as a unit increase in the FDI resulted into the decline of manufacturing value added by a tune of 0.476 units and
0.173 units respectively. However, the negative effect was higher in the short run at 5% level. Adejumo also reported that the model corrected itself from the previous disequilibrium to the current year in the manufacturing value added to current by 36 percent. Adejumo and Anowor et al. study conducted in the same year in the Nigerian economy provides conflicting results. We believe the selection of different estimation technique resulted in Adejumo, unlike Anowor et al. to find that Nigeria did not benefit from FDI both in the short run and long-run period.

Lartey (2017) studies looked at whether FDI inflows non-tradeable sector (service sector) more than tradeable sector (agricultural and manufacturing sector) in the forty-four emerging and developing countries from 1990 – 2006. Lartey applied system GMM and noted that the technique reduces omitted variables bias that might affect the cross-sectional estimates involving forty-four countries. The Lartey result suggests that FDI benefited the non-tradeable sector vis-à-vis tradeable sector. In other words, during the study period, FDI to forty-four countries resulted in an increase of non-tradeable sectoral output by roughly0.031units to 0.034 units for every additional increase in FDI.

3.5 Empirical equation and results

To capture the effect of FDI on the different sector of the economy in the EAC region, we adopted Solow growth (1956) model as our analytical theory. We estimated our model using Difference Generalized Method of Moments (DGMM). We also provided the Table 3.7 which variables used in this study. Four countries were involved in this study. That is Uganda, Kenya, Tanzania, and Rwanda.

We used Solow growth (1956) theory as our analytical framework (refer to methodology and empirical result section 3.3 above). However, our empirical equation is adopted and modified from Lartey's (2017) empirical study. According to Lartey, we can capture the effect of FDI on the ratio tradeable output to non-tradeable output in the EAC region. Therefore, we closely followed Lartey study both in terms of variables used and estimation technique. Lartey's examined the effect of FDI on ratio tradeable output ton non-tradeable out for the forty-four emerging and developing countries and uses GMM to capture the effect, refer to equation (3.4) above.

In addition, we computed the ratio tradeable output to non-tradeable output by following Larty's (2017) methodology while in computing technology gap; we followed Elboishi (2015) methodology as seen on equation (3.6) below.

$$\text{Technology gap} = \frac{(Ymax_t - Y_{i,t})}{Y_{i,t}} \tag{3.6}$$

Where, $Ymax_t$ denotes GDP per capita of the United States in time $\approx t$ and $Y_{i,t}$ is the GDP per capita of the four EAC member countries (i.e., Uganda, Kenya, Tanzania, and Rwanda) in time t. Where t is the study period spanning from 1970, 1971….2017.

According to Lartey (2017), the ratio tradeable output to non-tradeable output can be computed as seen in equation (3.7)

$$= \frac{(manufacturing\ output + agricultural\ output)}{(Service\ output)} \approx \frac{(Tradeable\ output}{(Non-tradeable\ output)} \tag{3.7}$$

Now we turn to the variables used in this section as seen in the Table 3.7 below.

Table 3.7 shows dependent variable, the ratio tradeable output to non-tradeable output and the key independent variable is FDI net inflows (% of GDP), in addition to vectors of control variables.

Variable	Definition	Measurement	Source
Manufacturing output	Manufacturing, value added (%GDP)	Tradeable output	World Bank national accounts data, and OECD national accounts data files
Agricultural output	Agriculture, value added (%GDP) output as	Tradeable output	World Bank national accounts data, and OECD national accounts data files
Service output	Service, value added (%GDP) output as	Service output	World Bank national accounts data, and OECD national accounts data files
FDIA	Foreign Direct Investment net inflows (% of GDP)	FDI inflows	World Bank, WDI database
GFCF	Gross fixed capital formation (% of GDP)	Domestic investment	World Bank, WDI database
HC	School enrollment, primary (% gross)	Human capital (skilled)	World Bank, WDI database
POPB	Population age 15 – 64	Labour force (unskilled)	World Bank, WDI database
Trade	Trade (% of GDP)	Trade Liberalization	World Bank, WDI database
Inflation	Inflation, consumer prices (annual %)	Macroeconomic instability	World Bank, WDI database
AID	Net Official Development Aid	Institutional quality	World Bank, WDI

	received per capita (Current US $)		database
Infrastructure	Fixed telephone subscriptions (per 100 people)	Telecommunication Infrastructure	World Bank, WDI database
CL	Civil liberty	Freedom status	Freedom House
PR	Political right	Freedom status	Freedom House
Technology gap	GDP per capita current us$	Technology gap between the EAC region and the US	World Bank, WDI database
Gov.	General government final consumption expenditure (% of GDP)	Tax Policy /Fiscal Policy	World Bank, WDI database

Source: The secondary data are obtained from the World Bank, and Freedom House.

Table 3.8 shows key variables and vectors of control variables (i.e. policy, institutional and political risk variables).

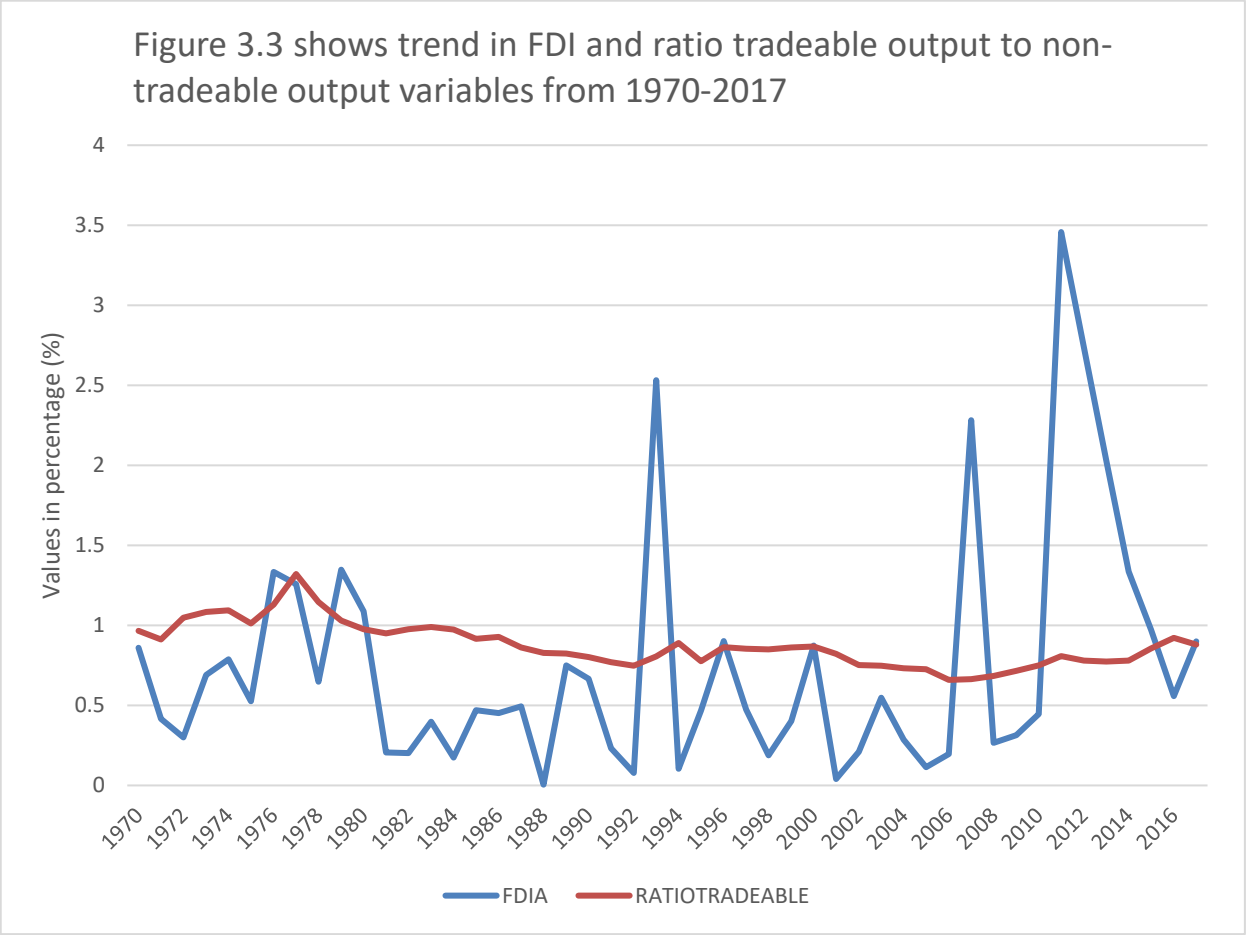
Key variables	Policy variables	Institutional quality variables	Political risk variables
- Ratio tradeable output to non-tradeable output - FD1A	- Inflation - Government consumption - Money supply - Trade liberalization - Technology gap - Domestic investment - Human capital - Labour force	- Aid - Infrastructure	- Civil liberty - Political right

Source: Own summary of the variables used in the study.

However, before we present empirical results and discussion on the role of FDI on sectoral output, we first started by presenting graphical analysis on the trends of our key variables, in addition to examining the relationship between key variables based on scatter plots and trends.

The result seen in figure 3.3 report trendline for FDI and ratio tradeable output to non-tradeable output from 1970 to 2017. During study period, FDI has been volatile while output to non-tradeable output variable is steady and roughly flat. The trendline graph seen in Figure 3.3 shows no association between the two variables. Figure 3.4 is scatter plots, showing relationship between FDI and ratio tradeable output to non-tradeable output variable during study period. The scatter plot incorporates liner trend line, displaying both equation and R-squared value of chart. On the vertical axis is our dependent variable (ratio tradeable output to non-tradeable output) and horizontal axis is our explanatory variable (FDI). The result in Figure 3.4 confirms result in Figure 3.3. R-squared value indicates that FDI does not cause variation in dependent variation. In addition, our empirical evidence reported in Table 3.10 shows that FDI had zero effect on ratio tradeable output to non-tradeable output during study period.

With respect to linear trendline, it is slightly downward sloping. What this indicate is that the EAC region received significant volume of FDI. And that the FDI seems have benefited non-tradeable sector vis-à-vis tradeable sector. In other words, FDI could have resulted into reduction of ratio tradeable to non-tradeable output during the study period.

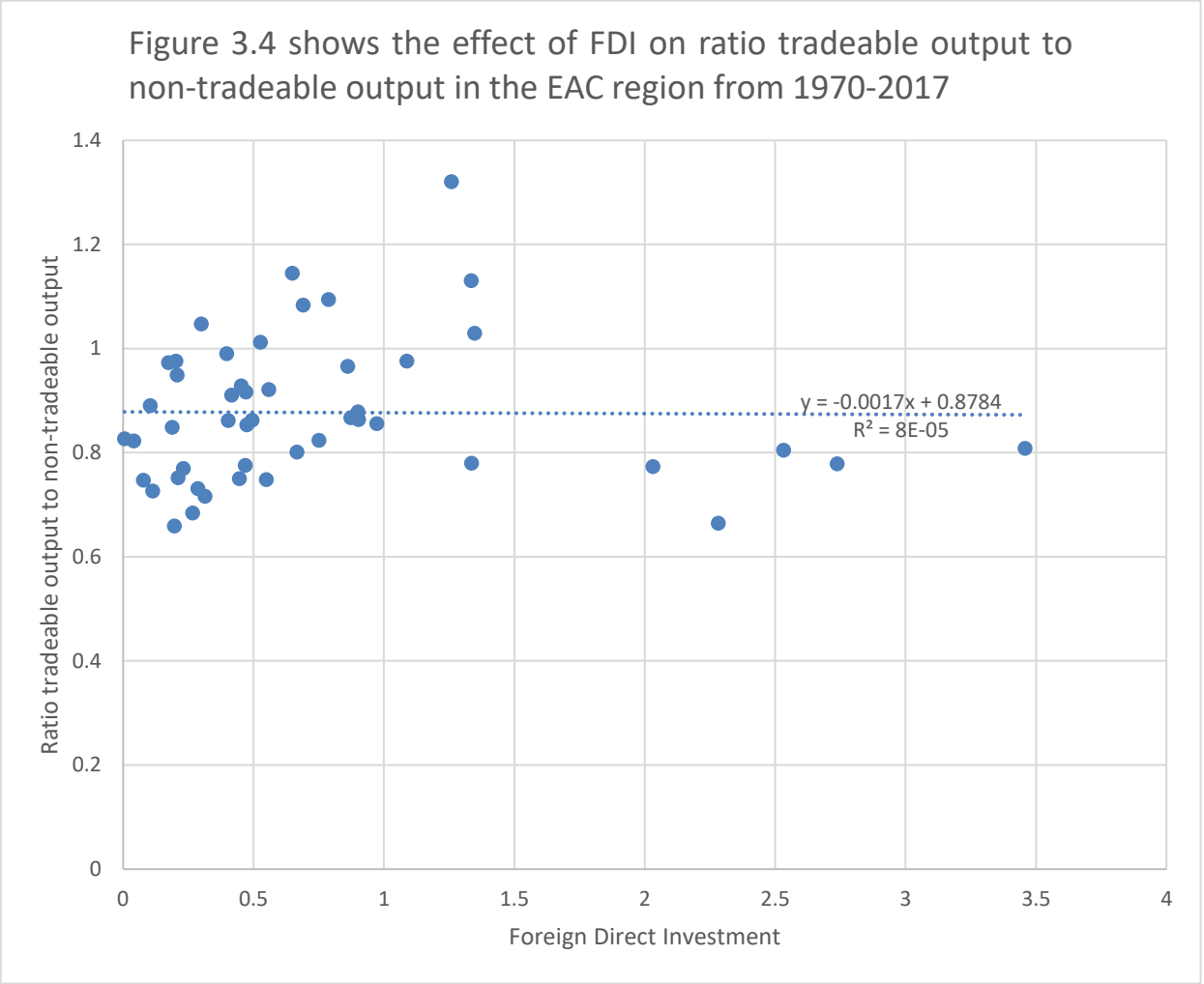


Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Ratiotradeable – represent the ratio tradeable output (agrictural and manufacturing output) to non-tradeable output (service sector). In other words, it shows sectoural output (agriculture and manufacturing) vis-à-vis those of service sectoral output in the EAC region from 1970 – 2017



Source: Own computation using EViews 8 (x64)

Note:

Foreign Direct Investment – represent foreign direct investment measured as FDI, net inflows (% of GDP) to the EAC region from 1970 – 2017

Ratiotradeable output to non-tradeable output – represent the ratio tradeable output (agrictural and manufacturing output) to non-tradeable output (service sector). In other words, it shows sectoural output (agriculture and manufacturing) vis-à-vis those of service sectoral output in the EAC region from 1970 – 2017

Before we present our empirical output seen in Table 3.9 below, we first shows the instrument specification model for the effect of FDI on the ratio tradeable output to non-tradeable output of the EAC region (micro level study) for the study period ranging from 1970 – 2017. The model specification ranges from model 1 – model 12.

Table 3.9 shows instrument variables used in the study of the role of FDI on sectoral output from 1970 – 2017 (see Table 3.10).

Models	Instrument model specifications
1	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC(-1) LPOPB LTRADE(-1) INFLATION LAID(-1) LFMD(-1) LFISCALPOLICY LTECHNOLOGY LPR
2	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC LPOPB LTRADE(-1) INFLATION LAID(-1) LFMD INFRAST(-1) LTECHNOLOGY LPR
3	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC LPOPB LTRADE(-1) INFLATION LAID(-1) INFRAST(-1) LTECHNOLOGY LPR
4	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC LPOPB LTRADE(-1) INFLATION LAID(-1) INFRAST(-1) LTECHNOLOGY LPR
5	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC LPOPB LTRADE(-1) INFLATION LAID(-1) INFRAST(-1) LCL
6	RATIOTRADEABLE(-1) FDIA LGFCF LHC(-1) LPOPB LTRADE INFRAST LPR(-1)
7	RATIOTRADEABLE(-1) FDIA LGFCF LHC(-1) LPOPB LTRADE
8	RATIOTRADEABLE(-1) FDIA LGFCF LHC(-1) LPOPB LTRADE INFRAST LPR(-1) LCL FDIA*LHC(-1)
9	RATIOTRADEABLE(-1) FDIA LGFCF LHC(-1) LPOPB LTRADE INFRAST LPR(-1) FDIA*LTRADE
10	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC LPOPB LTRADE(-1) INFLATION LAID(-1) INFRAST(-1)
11	RATIOTRADEABLE(-1) FDIA(-1) LGFCF LHC(-1) LPOPB LTRADE(-1) INFLATION(-1) LFMD(-1)
12	RATIOTRADEABLE(-1) FDIA LGFCF LHC(-1) LPOPB

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

3.5.2 Role of FDI on sectoral output – Empirical results

Table 3.10 below present our reports on the contribution of FDI inflows on the different economic sectors of the EAC region. Therefore, our analysis is based on the effect of FDI on the ratio tradeable output to non-tradeable output is seen in Table 3.10. The study period ranges from 1970 – 2017. The study result supports the notion that FDI inflows to the EAC region during the study period supported the non-tradeable output (service sector) sector vis-à-vis tradeable output (agricultural and manufacturing sector).

Table 3.10 shows the effect of FDI inflows on the ratio tradeable to non-tradeable output from the year 1970 – 2017.

Regressor	**Model 8**	**Model 7**	**Model 6**	**Model 5**	**Model 4**	**Model 9**	**Model 12**	**Model 11**	**Model 10**	**Model 3**	**Model 2**	**Model 1**
	1	2	3	4	5	6	7	8	9	10	11	12
FDIA	-0.0134	0.017	0.0178	-0.0015	-0.0055	0.0085	0.1296	-0.4566	0.5164	-0.0058	-0.0355	0.0189
	(-0.4551)	(-0.3785)	(-0.3561)	(-0.9504)	(-0.8315)	(-0.4552)	(-0.1722)	(-0.4184)	(-0.2428)	(-0.8252)	(-0.1722)	(-0.1831)
LGFCF	-0.4128**	-0.3466*	-0.3386*	-0.4880*	-0.5121**	-0.3735***	-0.3824**	-0.3598***	-0.4251***	-0.5125*	-0.7858**	-0.3633*
	(-0.0115)	(-0.0686)	(-0.0665)	(-0.0704)	(-0.0474)	(-0.0024)	(-0.0151)	(-0.0007)	(-0.0016)	(-0.0662)	(-0.0297)	(-0.0815)
LHC	-0.7092*	-0.1696	-0.1766	-0.0747	-0.0761	-0.7819*	-0.3966	-0.5198	-0.7858**	-0.0856	-0.925	-1.0853
	(-0.0609)	(-0.452)	(-0.4264)	(-0.7749)	(-0.7479)	(-0.0582)	(-0.4133)	(-0.2685)	(-0.0423)	(-0.7353)	(-0.125)	(-0.1951)
LPOPB	-1.041	-1.3103***	-1.2530***	-1.8273***	-1.9964***	-1.4290***	-1.0668***	-1.1374**	-1.5876***	-2.0048***	-1.6005**	-1.9257**
	(-0.1538)	(-0.0018)	(-0.004)	(-0.0015)	(-0.0028)	(-0.0045)	(-0.0009)	(-0.0377)	(-0.0052)	(-0.0026)	(-0.0137)	(-0.0373)
LTRADE	0.3876*	0.4211*	0.4201***	0.6249*	0.7123**	0.2153*	0.1944	0.1579	0.3205*	0.7077*	0.8271*	
	(-0.069)	(-0.0866)	(-0.0827)	(-0.095)	(-0.0398)	(-0.0582)	(-0.2008)	(-0.1864)	(-0.0649)	(-0.0542)	(-0.0661)	
INFLATION	0.0001	0.0001	0.0000	-0.0015	-0.0018					-0.0018	-0.0048	
	(-0.9413)	(-0.972)	(-0.9997)	(-0.4696)	(-0.3584)					(-0.3788)	(-0.3377)	
AID		-0.0048	-0.005	-0.0051	-0.0053					-0.0051		
		(-0.2934)	(-0.2644)	(-0.372)	(-0.3251)					(-0.3893)		

INFRAST	0.1179	-0.1731	-0.1609	-0.2978*	-0.3255*	0.0256	-0.0387	-0.0225	0.0237	-0.3193*		
	(-0.3184)	(-0.1688)	(-0.1994)	(-0.0604)	(-0.0602)	(-0.7156)	(-0.4167)	(-0.7826)	(-0.7131)	(-0.0607)		
LCL					0.0234		-0.2678**	-0.1104				
					(-0.7677)		(-0.0182)	(-0.3097)				
LPR	0.0146	0.0831	0.0815	0.0874		-0.0209	0.2497**	0.1733	0.0018			
	(-0.8308)	(-0.2461)	(-0.2518)	(-0.3287)		(-0.9362)	(-0.0112)	(-0.6128)	(-0.9937)			
LTECHNOLOGY	-0.1828**	-0.2234***	-0.2235***				-0.088					
	(-0.0516)	(-0.0032)	(-0.0028)				(-0.4221)					
LFMD	0.0332	0.0161										
	(-0.9357)	(-0.8656)										
LGov	-0.2073											
	(-0.2156)											
FDIA*LTRADE									-0.1238			
									(-0.2448)			
FDIA*LHC								0.0996				
								(-0.4108)				
FDIA*LTECHNOLOGY							-0.0291					
							(-0.1946)					
Total panel observation	184	184	184	184	184	184	184	184	184	184	184	184
Periods included	46	46	46	46	46	46	46	46	46	46	46	46
Cross-section included	4	4	4	4	4	4	4	4	4	4	4	4
Number of instruments	12	12	11	10	10	8	11	10	9	9	8	5
Sargan test J-Stat	0.3723	2.2071	2.0906	1.4792	0.9399	1.99	0.3248	2.1128	1.7295	1.0121	0.9541	1.2806
	(-0.5418)	(-0.1374)	(-0.1482)	(-0.2239)	(-0.3323)	(-0.1583)	(-0.5687)	(-0.1461)	(-0.1885)	(-0.3144)	(-0.6206)	(-0.2578)

Arellano-Bond Serial Correlation Test												
(m-Stat): Test Order												
AR(1)	2.3615	0.2874	0.2695	1.1136	1.4667	0.8139	0.3065	1.4453	1.8664	1.3832	1.0447	-0.692
	(-0.0182)	(-0.7738)	(-0.7875)	(-0.2655)	(-0.1424)	(-0.4157)	(-0.7592)	(-0.1484)	(-0.062)	(-0.1666)	(-0.2962)	(-0.4889)
AR(2)	0.7196	-1.5334	-1.4803	-0.561	-0.5662	1.4169	-0.6628	0.27	1.3265	-0.416	0.2873	1.0269
	(-0.4717)	(-0.1252)	(-0.1388)	(-0.5748)	(-0.5712)	(-0.1565)	(-0.5074)	(-0.7872)	(-0.1847)	(-0.6774)	(-0.7739)	(-0.3045)
Wald Test Chi-Square	29.47289***	33.3577***	33.4529***	20.7554**	18.2209**	25.8462***	40.6718***	35.8215***	27.8359***	18.4800**	11.7514*	11.0960**
	(-0.0019)	(-0.0005)	(-0.0002)	(-0.0138)	(-0.0327)	(-0.0005)	(0.0000)	(0.0000)	(-0.0005)	(-0.0179)	(-0.0678)	(-0.0255)

Source: Own computation using Eviews software 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. The Sargan test of over-identifying restrictions is asymptotically distributed as χ^2 under the null of instruments validity. AR(1) and AR(2) are the Arellano and Bond (1991) tests for first- and second-order serial correlation in the differenced residuals, which are asymptotically distributed as a N(0,1)under the null of no serial correlation.

Table 3.10 results indicates that FDI netinflows (%GDP) (FDI) has zero effect on the ratio tradeable output to non-tradeable output.

We believe that the zero effect of FDI on different sectors of the economy in the EAC region might be due to low absorptive capacity as well as low amount of FDI to the non-tradeable sector and tradeable sector during the study period. For instance, as discussed in the introduction Chapter one, in the year 2017, World Bank data indicate that average FDI inflows as a percentage of GDP to the EAC region stood only at 1.805%. From our finding, most of these FDI inflows went to non-tradeable (service sector). The available annual report from the Central Bank of Tanzania, Uganda and Rwanda shows that non-tradeable sectors receive more FDI than the tradeable sector. We expected FDI to results into reduction of ratio tradeable to non-tradeable output, given the amount of FDI that goes to the sector recieves.

For example, the Bank of Tanzania report (2014), Tanzania Investment report (2014) on foreign private investment shows that in the year 2013, FDI flows to manufacturing was US$ 386.6 million, while the agricultural sector received the least amount of FDI inflows, only US$ 10.3 million. According to Lartey (2017), the tradeable sector received US$ 396.9 million. Which is less than the amount of FDI flows non-tradeable. The report shows that in the non-tradeable sector, the top three subsectors that received the most FDI flows in the year 2013 were financial and insurance, recorded largest FDI flows on US$ 752.2 million, followed by information and communication subsector at US$ 185.1 million. While wholesale and retail trade registered US$ 123.5 million.

Therefore, according to Tanzania Investment Report, 2014, it seems that even though much of FDI inflows went to the non-tradeable sector than the tradeable sector – the effect on non-tradeable sector was zero. Similarly report from Bank of Uganda, Private Sector Investment Survey (2017) shows that Tradeable sector only received FDI stock worth US$ 3886.5 million in the year 2016 while non-tradeable sector received FDI stock amounting to US$ 6314.4 million. Moreover, Nation Bank of Rwanda Report, Foreign Private Capital (2017) the top four sectors to receive the FDI stock in the year 2016 were information, communication and technology (ICT) (US$ 541.5million), followed by finance and insurance US$ 338.01 million, where manufacturing and tourism sector received US$ 213.9 and US$ 171.01 respectively.

However, our empirical results were different to that of Lartey (2017). In Larty's (2017) report, the result shows that FDI inflows to developing countries reduce ratio tradeable to non-tradeable output.

The review of existing literatures provides inconclusive evidence pertaining effect of FDI to different sector of the economy. For example, a recent study by Epaphra and Mwakalasya (2017) shows that FDI to Tanzania from the year 1990 – 2015 led to reduction of the agricultural sector.

Similarly, Alfaro in the year 2013 also found that FDI does not benefit the primary sector for the forty-seven developing (including Nigeria and Tunisia) and transition economies. Alfaro argument suggests, because agricultural activities form part of the primary sector – and that productivity spillover in the primary sector is low vis-à-vis manufacturing sector. Studies from Epaphra and Mwakalasya (2017) and Alfaro (2013) indicate that FDI hinders the productivity of the agricultural sector. Conversely, Salimane et al. (2016) found that FDI to the fifty-five developing countries increased agricultural output. Moreover, Salimane at al (2016) further noted that an increase in agricultural productivity guaranteed food security for the developing economy. Considering the effect of FDI on the manufacturing sector, Orji et al. (2015), Okoli and Agu (2015) and Adejumo (2013) reported that FDI hindered the progress of the manufacturing sector in Nigeria. However, most empirical studies suggest FDI improves the performance of manufacturing sector in Africa (Adegboye et al. (2016; Salimane et al., 2016; Anowor et al., 2013; Cipollina et al., 2012; Alfaro, 2003).

Therefore, we believe that FDI to agricultural sector hindered the development of the agricultural sector in the EAC region. We attribute a reduction in productivity of the agricultural sector to low FDI inflows to agricultural in the EAC region as reported in the Bank of Uganda, Private Sector Investment Survey 2017. We also argue that limited FDI to the manufacturing sector like steel and tub industries limited in Uganda, the cement industry in Kenya and leather production factory in Tanzania might resulted into zero effect of FDI to tradeable sector.

For instance, if the EAC region received significant amount of FDI, specifically to the manufacturing, there would be expansion of tradeable sector vis-à-vis non-tradeable sector. This could have happened due to higher productivity spillover in the manufacturing sector (Markusen, 1995).

In the context of our study, owever, the service sector, mainly financial institutions, ICT subsector, and professional service (i.e., medical doctors and consultants) benefited more from the FDI inflows to EAC region as they received larger share of FDI during the study period. We believed, even though there is zero effect of FDI on ratio tradeable to non-tradeable output. We felt that if significant amount of FDI was received and that the region had good absorptive capacity, this would have led to the expansion of the non-tradeable output (i.e., service) in the EAC region. This is because sector non tradeble sector tend to employ mainly skilled workforce. Hence the case in our argument that if there was significant FDI inflows to EAC region, this could have resulted into reduction of ratio tradeable to non-tradeable output.

Lartey's (2016) results show that a unit increase in domestic invest (proxy by investment/GDP (%)) results into a significant expansion of tradeable output to non-tradeable output by 0.030 units to 0.038 units.

In our Table 3.10, the result indicates that a unit improvement in the productivity of domestic investors results in a significant reduction of the ratio tradeable to non-tradeable output by 0.338 units to 0.786 units, and statistically significant.

We note that the non-tradeable sector, in the context of the EAC region, is vast. For instance, non-tradeable sector comprises of electricity and gas supply, water supply, wholesale and retail, transportation and storage, ICT, hotels, finance and insurance, real estates and professional in addition to a housemaid. Therefore, because of low capital requirements compared to the manufacturing sector, most domestic investors are engaged in the non- tradeable sector.

The result further indicates that investment in human capital from 1970 – 2017 benefited non-tradeable. In other words, a unit increase in human capital resulted in a significant reduction in ratio tradeable to non-tradeable output for the EAC region by 0.709 units to 0.786 units. We argue that skilled personnel tend to be employed in the service sector such as finance and insurance, education and health sector, among others.

According to Bank of Uganda, private sector investment annual report for the year 2017, total employment (both foreign and local nationals) for the tradeable sector for the year 2016 stood at 37,503 personnel. While non-tradeable sector (i.e., electricity and gas, water supply, construction, wholesale and retail, transportation and storage, administrative service, accommodation and food, I.C.T, finance and insurance, real estate and professionals) employed 61,150 personnel, consider the economic theory that suggests the price of labour equates to marginal product of labour.

Therefore, this that means in a free market economy, the more productive labour should command higher wages.

According to Nation Bank of Rwanda report 2017, it shows that total compensation for employees (i.e., salary, wage, fringe benefits, and contribution to the pension fund) paid to companies' staff/employees amounted toUS$331.4 for the year 2016, reflecting an increase of 23.5% from the previous year, with the best remunerating sector being finance and insurance and accounting for 48.5% of total remuneration.

In terms of labour force availability, the study shows that a unit increase in labour force availability results into a significant reduction in ratio tradeable to non-tradeable output by roughly 1.067 units to 2.005 units. Suggesting that the presence of the labour force in the EAC region from 1970 – 2017 benefited the non-tradeable sector. We argue that this could be due to the majority of the EAC region citizenry working in non-tradeable sectors.

With regards to trade openness, Lartey (2017) study indicate that a unit rises in trade liberalization from 1990 – 2016 significantly resulted into reduction of ratio tradeable to non- tradeable output by 0.028 units to 0.04o units for the forty-four emerging and developing countries. Conversely, we

found that a unit improvement in trade liberalization in the EAC region from 1970 – 2017 resulted into expansion of ratio tradeable to non-tradeable output by 0.388 units to 0.827 units. The expansion of tradeable output vis-à-vis non-tradeable output in the EAC region could be attributed to the fact that most exports comprise of raw materials and semi-manufactured goods. Moreover, the African Growth and Opportunity Act (AGOA) enacted in the year 2000 and subsequently renewed up the year 2025 further encouraged exportation of tradeable products by SSA countries to the US. Besides, the result also indicates that the non-tradeable sector is not well developed for the EAC region services such as consultant, professionals to be exported abroad.

In the context of infrastructural development in the EAC region, the report in Table 3.10 indicates that a unit increase in the improvement of infrastructure development significantly results to the expansion of non-tradeable output relative to tradeable output by 0.300 units to 0.326 units. We posit that because proxy for infrastructure is fixed telephone line, this means more investment in the sector results into improvement in the I.C.T sector hence lowering communication costs. Moreover, subsector such as banking (such as mobile banking) and insurance companies cannot effectively operate without efficient and inconsistent availability of telecommunication infrastructure.

According to our study, we report that the technology gap between the leading world (i.e. US) and the EAC region is higher in the tradeable sector relative to the non-tradeable sector. For every increase in the technology gap between tradeable to the non-tradeable sector, it results in a significant increase in the productivity of non-tradeable output. Therefore, model 1 and 3 results show that a unit increase in the technology gap in the EAC region from 1970 – 2017 significantly accounted for the reduction of ratio tradeable to the non-tradeable sector by 0.183 units to 0.224 units respectively. We argue that because non-tradeable sector tends to attract more FDI inflows relative to the

tradeable sector, this results in a reduction of the technology gap between the US and the EAC region concerning non-tradeable sector vis-à-vis tradeable sector.

Furthermore, our study shows that political right has played a significant role in expanding ration tradeable to non-tradeable output in the EAC region during the study period. Conversely, civil liberty promotes non-tradeable output relative to tradeable output. For instance, Table 3.10, model 7, the evidence indicates that a unit improvement in the political right significantly results in the expansion of tradeable output relative to non-tradeable output by 0.250 units. In terms of civil liberty, reported in model 7, a unit increase in civil liberty significantly reduced ratio tradeable to non- tradeable output by 0.268 units. In the context of the EAC region, most agricultural activities take place in rural areas. Moreover, political instability caused by the formation of rebel

groups like the Lord Resistance Army in Uganda terrifies the rural areas. The political instability affects agricultural output, subsequently reducing manufacturing out as raw materials are agricultural products, like meat processing plant in Soroti district in Uganda. In terms of civil liberty, we argue that because most employees are professions are well educated; and they seek for improvement of the rule of law and accountability that protects the interests of ordinary citizens. Thereby, guaranteeing freedom of speech and association that is common in the non-tradeable. Moreover, the presence of the rule of law promotes trust between economic agents in the non-tradeable sector — service sectors.

In this study, just like FDI variable, we found that variables such as inflation (proxy macroeconomic stability), official development aid per capita (i.e. aid) (a proxy for institutional quality) and government consumption had zero effect on the ratio non-tradeable output to tradeable out. Contrary to our results, Lartey, (2017), found that government expenditures benefited the tradeable output of the forty-four emerging and developing countries to a tune of 0.039 units to 0.051 units during the study year, and that a unit improvement in the financial sector development (proxy by M2/GDP (%)) in the forty-four countries led to a significant reduction in ratio tradeable to non-tradeable output by roughly 0.089 units to 0.120 units.

In a nutshell, our study reveals that variables such as domestic investment, human capital, labour force availability, trade liberalization, infrastructure, and technology gap, political risk variables (i.e. political civil and political right) had a significant effect on the tradeable output and non-tradeable output. To the contrary, aid, inflation and FDI inflows had zero effect on ration tradeable output to non-tradeable output during the study period.

Furthermore, we found that domestic investment, human capital, labour force availability, infrastructure, technology gap, and civil liberty significant supported the productivity of the non-tradeable output relative to tradeable output. Conversely, an improvement in the trade liberalization, political right has led to the expansion of ratio tradeable to non-tradeable output in the EAC region during the study period.

3.6 Effect of Sectoral output on economic growth

In this section, we wanted to understand the contribution of different sector of the economy on the economic performance of the EAC region from 1970-2017. We analysed empirical literatures to ascertain the effect of agriculture, service and manufacturing sector on economic growth of developing countries. We also provided the methodology and discussion of our empirical results. We concluded by provided brief concluding remarks. We started by discussing the empirical literature pertaining the effect of agricultural output on the economic growth of the developing countries.

3.6.1 Effect of agricultural output on economic growth

Duru et al (2018) conducted comparative analysis on the contribution of agricultural output on the Nigerian and Ghana's economy from 1985 to 2014. They applied Vector Error Correction (VEC) mechanism to capture effect. Their long-run models indicates that only industrial output supported economic growth of Nigeria, unlike agricultural and service sector, whereas for the case of Ghana, the study reveals that all sectors (i.e. agricultural, service and industrial sector) had positive effect of economic growth of the economy, with agricultural output accounted for larger share as reflected in the magnitude of the coefficient. Further, in the short-run it was service sector which had positive relationship with the economic growth of Nigeria and Ghana, although that of Nigeria was much larger.

Adesoye et al. (2018) examined the relationship between agricultural productivity and economic performance of the Nigerian economy from 1981 – 2015. For Adesoye et al. to achieve their research objective, they applied the Autoregressive Distributive Lag (ARDL) model. Adesoye et al. reported that agricultural productivity supported the economic growth of Nigeria in the short and long-run. However, unlike in the short-run, we found a negative association between agricultural productivity and economic growth in the long-run. We also found that agricultural productivity effect on economic growth takes longer to create a
meaningful effect on economic growth the short-run effect. For, example, Adesoye et al. results suggest that the effect of two period lag of productivity exerts more pressure on economic growth by 0.214 units for every additional unit of agricultural productivity in Nigeria. In support of their findings, Adesoye et al. referred to the study by Eddine Chebbi (2010) and Gardner (2005) which found that agriculture is an engine of economic growth in developing countries.

Dike (2018) explored whether foreign agricultural investment (or agricultural FDI) has any decisive role in the economic growth of five SSA economies from 1995 – 2016. Dike's economic

growth is proxy by GDP. The result from Dike's panel VECM Granger causality indicates that foreign investment in the agricultural sector has benefited economic growth of five SSA economies both in short and long0run. However, the positive benefit arising from foreign investment in the agricultural sector was much higher in the long run.

In the year 2017, Sertoglu et al. (2017) studied the effect of agricultural output on the economic growth of Nigeria from 1981 – 2013. Sertoglu et al. applied the VECM technique and captured the long-run relationship between agricultural output and economic growth by using the Johansen co-integration test. Sertoglu et al. reported that there was a long-run relationship between agricultural output and economic growth. They further said, although there was a positive effect of agricultural output on the economic performance of Nigeria, in the long-run, however, they said the effect is reduced to zero when oil variable is accounted for in the model.

Olajide et al. (2012) examined the contribution of agricultural output on the economic growth of Nigeria from 1970 – 2010. Just like Oji-Okoro (2011), Olajide et al. also hey adopted Ordinary Least Square (OLS) method to analyze secondary data collected from Central Bank of Nigeria. Olajide et al.'s empirical evidence suggests that a unit increase in agricultural output significantly accounted for 0.325 units of economic growth of Nigeria during the study period. We found that they have accounted for heteroskedasticity, but the presence of serial correlation was not investigated. Moreover, in the year 2011, Oji-Okoro also studied the effect of agricultural production on the economic growth of Nigeria from 1986 – 2007. Oji- Okoro reported the result from multiple linear regression analysis that agricultural productivity benefited the Nigerian economy during the study period. Oji-Okoro further pointed out that the insignificant effect of agricultural on the economic growth of Nigeria could be explained by the low yield of agricultural output, rudimentary tools used in farming and low-quality agricultural seeds.

However, we observed that both Olajide et al. (2012) and Oji-Okoro (2011) methodology did not control for policy variables such as macroeconomic and political instability which might influence economic growth given that more extended study period is utilized. Moreover, simple OLS regression cannot take care of the endogeneity problem that might exist in the model.

3.6.2 The effect of Manufacturing and service output on economic growth

Addo (2017) conducted qualitative research to understand the contribution of the manufacturing sector on the economic performance of Ghana's economy. The study period ranges from 2006 to 2012. Addo obtained needed primary data from twenty manufacturing companies based in the capital city of Ghana, Accra employing a questionnaire survey. Addo utilized SPSS statistical method in the study.

Moreover, descriptive and inference statistic was applied to capture the relationship between the manufacturing sector and economic growth. Addo concluded that manufacturing sector promotes the economic performance of Ghana. However, Addo observed that Ghana's government should provide a business-friendly environment through the provision of the formidable legal and regulatory environment and flexible tax system. In the same year, Tsoku et al. (2017) also examined the relationship between manufacturing growth and economic growth of South Africa.

Tsoku et al. (2017) applied the Johansen co-integration test to investigate Kaldor's (1966/67) theory of economic growth of South Africa. Tsoku et al. show a positive long-run association between the manufacturing sector and economic growth. However, for the service sector, it turns out to be harmful from 2001 to 2014. Tsoku et al. argued that the presence of a positive relationship between the manufacturing sector and economic growth validates Koldors's growth theory. Moreover, Tsoku et al. further found the presence of unidirectional Granger Causality running from manufacturing and service sector to economic growth, indicating that the manufacturing and service sector significantly supports the economic growth of South Africa during the study period.

Tsoku et al. (2017) results seem to gain support from Zalk (2014) study, which found that the manufacturing sector is South Africa's engine of growth. Zalk study consist of empirical survey and found that, by the end of World War two and mid-1970s, South Africa's real growth rate stood at 4.7% Zalk (2014) observed that during this period, South Africa's manufacturing sector growth was at 7.3%, higher than South Africa's real economic growth rate of 4.7%. Our observation based on Tsoku et al.'s study is that there is a positive association between manufacturing sector growth and economic growth of South Africa. Moreover, according to Solow growth model, countries with lower capital stock tend to grow faster. During the first and second world war, most country's capital stock base where destroyed; therefore, investment

capital would result in economic growth as evidenced by Zalk (2014) study.

Sheridan (2014) investigated the effect of the manufacturing sector on the economic growth of developing countries from 1970 – 2009, and cross-sectional data on eighty-six countries were used. Sheridan study specifically looked at whether manufacturing export rather than primary export has a more significant effect on the country's economic growth. Sheridan noted that, although panel data study could be estimated using POLS and FEM, regression tree technique was favoured. Sheridan said that, unlike Hansen method which allows for only one threshold for each threshold variable to be examined, that regression tree technique imposes no such restrictions. We observed that country's that primary export products do benefit the economic growth of such countries. However, the export of manufactured products significantly benefits the country. However, Sheridan observed that the threshold of human capital is required for a country to benefit from manufacturing export.

Tregenna (2008) investigated the contribution of service and manufacturing sectors to employment creation and economic growth of South Africa. Tregenna applied input-out-put to examine the relationship between economic growth from 1980 –2005. Tregenna observed that the share of the service sector to GDP continue to rise as manufacturing sector contribution decline steadily. We observed that a fall decline in the manufacturing sector could hurt South Africa's economy in short and long-run. According to Tregenna study, we conclude that both Service and manufacturing sector has benefited the South African economy

Metahir (2012) investigate the relationship between the agricultural sector and industrial sector in Malaysia from 1970 – 2009. Metahir utilised Johansen and Juselius (1990) cointegration technique to investigate the long-run relationship between the two variables. Moreover, to captured short and long-run causality between agricultural and industrial sector, Toda-Yamamoto (1996) causality tests. We found a significant presence of unidirectional causality running from the industrial sector to the agricultural sector in short and long-run during the study period in Malaysia.

Amutha and Juliet (2017) looked at the contribution of the role of the service sector in the Indian economy from 1950 – 2016. The data obtained from the Central Statistical Organization, and they noted that the service sector is the largest in India. For instance, for the year 2015 to 2016, they reported that service sector accounted for 63% of the Indian GDP while agriculture and manufacturing accounted for 23% and 32% of the Indian GDP respectively — largest sector. Furthermore, Amutha and Juliet also cited that work of Bhattacharya and Mitra (1990) which pointed out that the service sector is the second employer after the agricultural sector. Amutha and Juliet noted that currently, the service sector is the largest recipient of FDI. Amutha and

Juliet, based on their secondary analysis, found that the service sector positively contributed to the economic growth of the Indian economy.

Oluwatoyese and Applanaidu (2013) examined the contribution of manufacturing, service and agricultural sector performance on the economic growth of Nigeria from 1980 – 2011, by collecting data from Central Bank of Nigeria. They conducted unit root test, serial correlation and heteroskedasticity to ensure the reliability of estimates. Oluwatoyese and Applanaidu applied Ordinary Least Square (OLS) estimation technique to capture the effect of service, manufacturing and agricultural contribution to the Nigerian economy during the study period. From Oluwatoyese and Applanaidu results, we observed that agricultural and service sector significantly contributed to the economic growth of Nigeria to a tune of 1.701 units and 5.424 units respectively, for an additional improvement in the productivity of agriculture and service sector. Moreover, during the study period, we found that the manufacturing sector had an insignificant detrimental effect on economic growth.

Eddine (2010) study looked at whether the sector of the economy in Tunisia compliments each other sectors. Eddine utilised annual time series data ranging from 1961 to 2007 which were collected from National Institute of Statistics and Central Bank of Tunisia. We report that Eddine applied Johansen cointegration test to establish the long-run relationship among variables, and the results show evidence of long-run relationship among variables understudy.

Eddine thereafter investigated the direction of causality through estimation of VECM derived from the long run cointegrating model. The result indicates unidirectional short-run Granger-Causality running from the real GDP of the agricultural sector to real GDP of the manufacturing sector during the study period. That is the improvement of the agricultural sector in Tunisia from 1961 to 2007 is positively associated with real economic growth of the manufacturing industry. According to Lartey (2017), we conclude evidence of tradeable sectoral growth, although it is being supported by agricultural sectoral output only. Moreover, the presence of bidirectional Granger causality between manufacture and agricultural sector would result in the more considerable expansion of the tradeable sector in Tunisia during the study period of 1961 – 2007.

3.7 Empirical equation and results

We attempted to empirically estimate the effect of ratio tradeable output to non-tradeable output on the economic growth of the EAC region. Burundi is excluded from the study due to lack of data. For the variables used in this section, refer to Table 3.7. Also, our empirical equation (3.8) is adapted from Lartey (2016) study.

$$Y_{it}=\alpha_0 + \alpha_1 RatioT_{i,t} + \alpha_2 FDI_{i,t} + \alpha_3 LF_{i,t} + \alpha_4 H_{i,t} + \alpha_5 DI_{i,t} + \alpha_6 A_{i,t} + \alpha_7 RatioT_{i,t} * A_{i,t} + \mu_i + \varepsilon_{it} \quad (3.8)$$

Where Y_{it} denote economic growth of the EAC region comprising of Uganda, Kenya, Tanzania, and Rwanda. Our key explanatory variable is $RatioT$ (i.e., ratio tradeable output to non-tradeable output) for the EAC member countries (comprising of Uganda, Kenya, Tanzania, and Rwanda) in period t, while t stand for the study period from 1970, 1971…...2017.

Furthermore, μ_i capture the unobserved country-specific time-invariant effect. $\propto$ denote regressor's coefficients of estimates, $\varepsilon_{i,t}$ is the error terms. FDI stands for foreign direct net inflows (% GDP). LF and HC is the factor of production comprising of the labour force and human capital, respectively. With DI representing a domestic investment and A is a vector of control variables namely, policy, institutional and political risk variables. $RATIOT_{i,t} * A_{i,t}$ captures the interaction between ratio tradeable output to non-tradeable output and control variables.

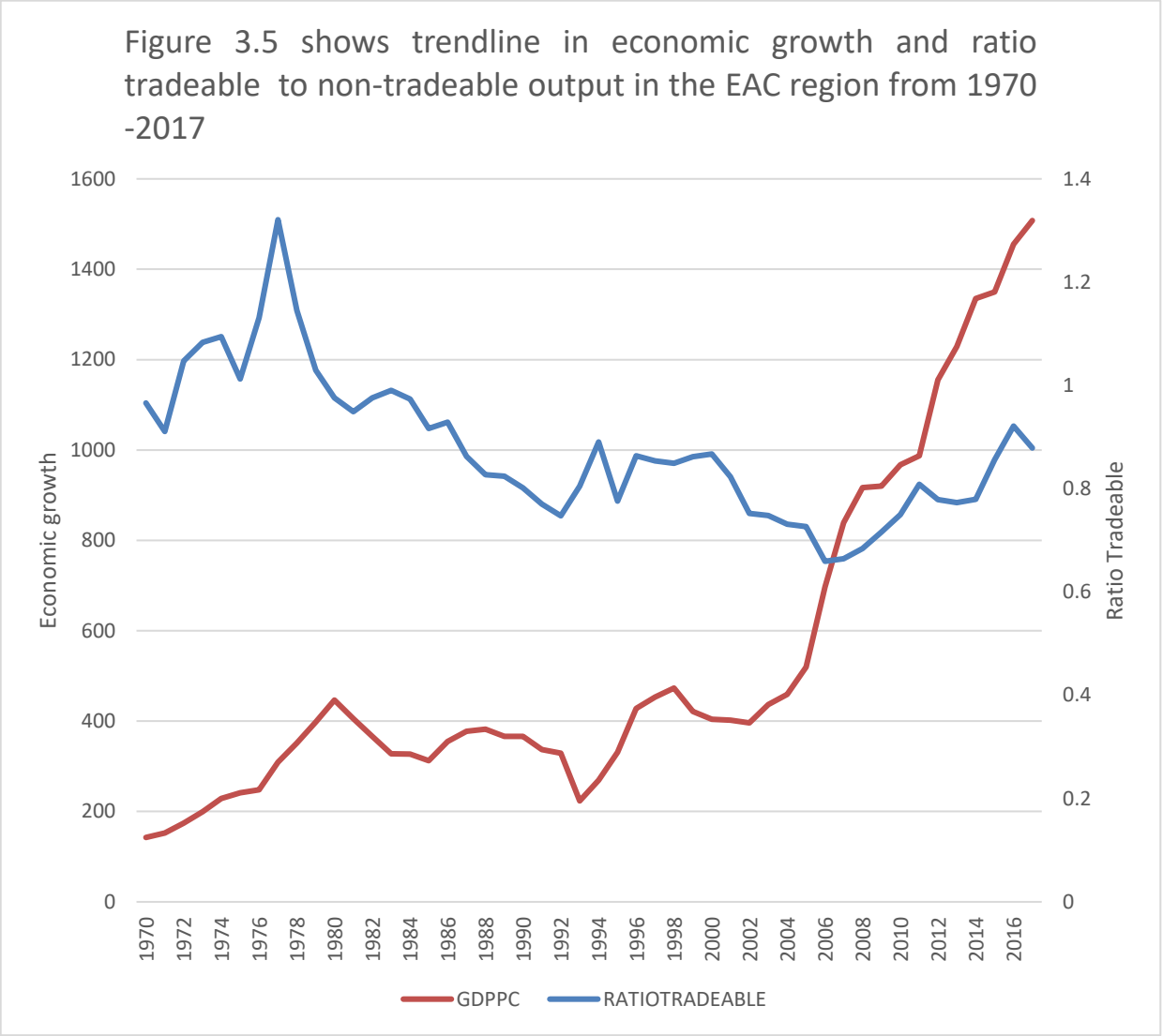
However, before presenting our empirical output and analysis on the effect of sectoral output on economic growth, we first started by presenting graphical analysis of trends in our key variables, in addition to examining the relationship between key variables based on scatter plots and trends. For example, the result seen in figure 3.5 shows trendline for economic growth and the ratio tradeable to non-tradeable output variable from 1970 to 2017. Evidence suggest that the two variables share similar trendline duriung the study period. Also, the gap between two variables was much wider in the 1970s, but contnue to narrow over time, with ratio tradeable to non-tradeable output variable economic growth in the year 2007. For the ratio tradeable to non-tradeable output variable, we spike in the year 1977 and this could be a sign of structural breaks in the varible.

Figure 3.6 is our scatter plot, we introduced linera trendline, displaying equation and R-squared value on chart to better reveal relationship between economic growth sectoral output (ratio tradeable to non-tradeable output variable). The vertical axis is depenednt variable (economic growth) and horizontal axis is our explanatory variable (ratio tradeable output to non-tradeable output variable variable). The linear trendline from 1970 to 2017 is downward sloping. Indicating negative relationship between economic growth and ratio tradeable to non-tradeable output variable.

In otherwords, expansion of ratio ratio tradeable to non-tradeable output variable results to economic decline for the EAC region during study period. Our R-squred indicates that ratio tradeable to non-tradeable output variable explainsvariation of economic growth by 0.16%.

The result in Figure 3.5 and Figure 3.6 is supported by empirical evidence seen in Table Table 3.12. The empirical results in Table 3.12 indicates that expansion of ratio tradeable output to non-

tradeable output significantly resulted into economic growth of the EAC region during the study period. However, in the presence of infratsructureal developlopment, humancapitan and labour force avaiability, the non-tradeable output significantly contributed to the economic growth of the EAC region during study period.

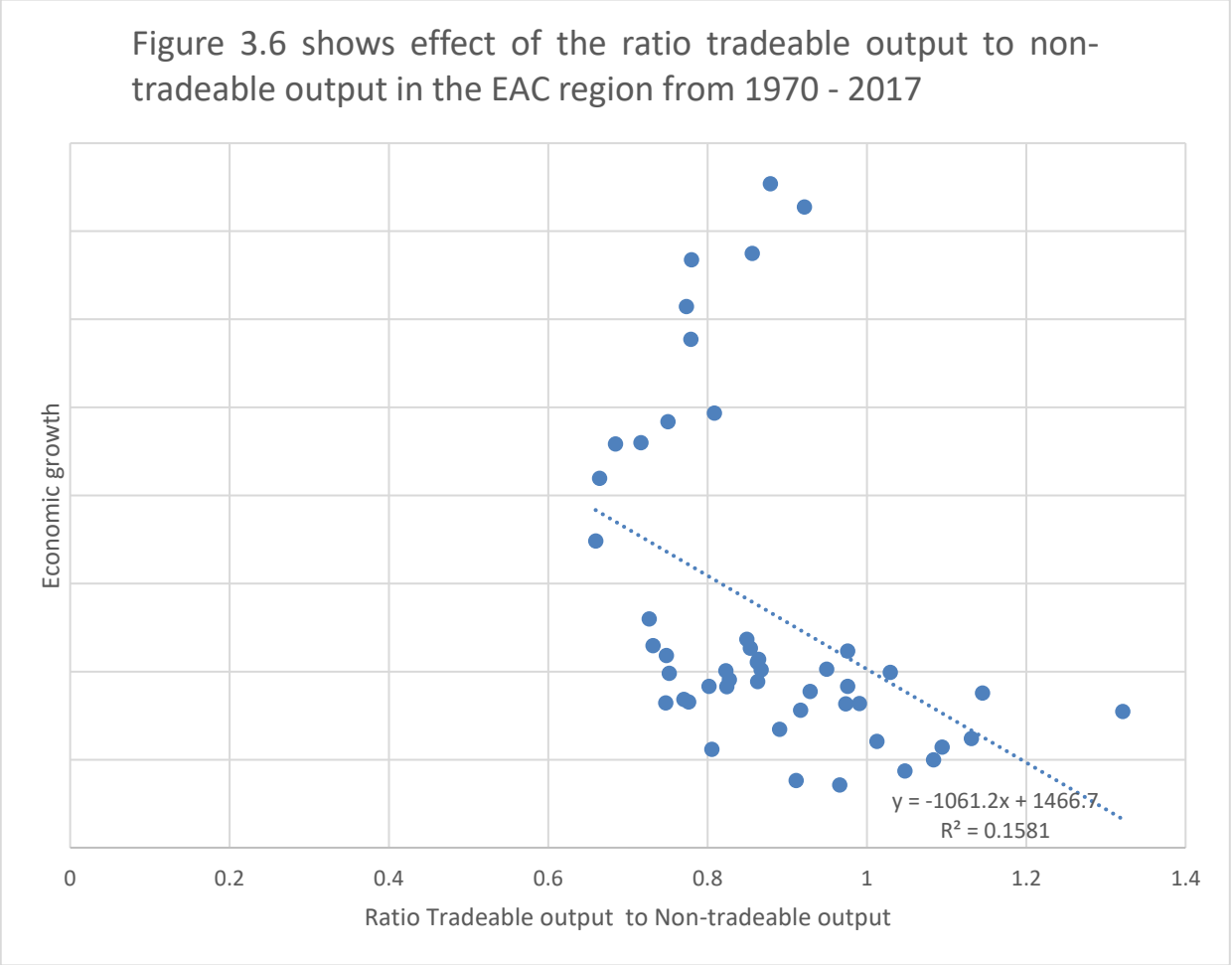


Source: Own computation using EViews 8 (x64)

Note:

GDPPC – represent economic growth of the EAC region from 1970 – 2017.

Ratiotradeable – represent the ratio tradeable output (agrictural and manufacturing output) to non-tradeable output (service sector). In other words, it shows sectoural output (agriculture and manufacturing) vis-à-vis those of service sectoral output in the EAC region from 1970 – 2017.



Source: Own computation using EViews 8 (x64)

Note:

GDPPC – represent economic growth of the EAC region from 1970 – 2017.

Ratiotradeable – represent the ratio tradeable output (agrictural and manufacturing output) to non-tradeable output (service sector). In other words, it shows sectoural output (agriculture and manufacturing) vis-à-vis those of service sectoral output in the EAC region from 1970 – 2017.

Table 3.11 shows instrument variables used in the study of sectoral output on economic growth of the EAC region from 1970 – 2017 (see Table 3.12).

Model	Model specifications
1	LGDPPC(-1) RATIOTRADEABLE(-1) LHC(-1) LGFCF(-1) FDIA(-1) LPOPB(-1) LTRADE INFRAST LPR LTECHNOLOGY(-1) LFISCALPOLICY(-1)
2	LGDPPC(-1) RATIOTRADEABLE(-1) LHC(-1) LGFCF(-1) FDIA(-1) LPOPB(-1) LTRADE(-1) INFRAST LPR LTECHNOLOGY(-1)
3	LGDPPC(-1) RATIOTRADEABLE LHC LGFCF FDIA(-1) LPOPB(-1) INFLATION LTRADE(-1) LFMD(-1) INFRAST LPR(-1)
4	LGDPPC(-1) RATIOTRADEABLE LHC LGFCF FDIA LPOPB(-1) INFLATION LTRADE(-1) LFMD LAID(-1) INFRAST(-1)
5	LGDPPC(-1) RATIOTRADEABLE LHC LGFCF(-1) FDIA LPOPB(-1) INFLATION INFRAST LCL RATIOTRADEABLE*LPOPB(-1)
6	LGDPPC(-1) RATIOTRADEABLE LHC LGFCF(-1) FDIA LPOPB(-1) INFLATION INFRAST LCL RATIOTRADEABLE*LPOPB(-1)
7	LGDPPC(-1) RATIOTRADEABLE LHC LGFCF FDIA LPOPB(-1) INFLATION INFRAST LCL RATIOTRADEABLE*LHC(-1)
8	LGDPPC(-1) RATIOTRADEABLE LHC(-1) LGFCF FDIA LPOPB(-1) INFLATION LTRADE LFMD
9	LGDPPC(-1) RATIOTRADEABLE LHC(-1) LGFCF FDIA LPOPB(-1) INFLATION LTRADE
10	LGDPPC(-1) RATIOTRADEABLE LHC(-1) LGFCF FDIA LPOPB(-1)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

3.7.2 Effect of sectoral output on economic growth

The Table 3.12 below is our empirical output on the effect of sectoral output on economic growth. That is the effect of ratio tradeable output to non-tradeable output on economic growth of the EAC region. The result suggests that the ratio tradeable output to non-tradeable output positively supports economic growth of the EAC region.

Table 3.12 shows the effect of the ratio tradeable to non-tradeable output (Sectoral effect) on the economic growth (1970-2017).

REGRESSORS	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
RATIOTRADEABLE TO NON-TRADEABLE	0.3842	0.976842*	0.2691	1.0542***	5.3372***	188.282**	149.2874***	0.3418	0.3692*	0.3123
	(-0.5179)	(-0.0752)	(-0.4489)	(-0.0014)	(0.0000)	(-0.0308)	(-0.0071)	(-0.1065)	(-0.0743)	(-0.3438)
LHC	2.3261***	2.4242***	1.2800***	-0.2913	2.6071**	-0.7812	33.5543***	3.4552***	3.3582***	4.7415***
	(0.0000)	(0.0000)	(-0.0012)	(-0.6581)	(0.0000)	(-0.4001)	(-0.0057)	(0.0000)	(0.0000)	(-0.0001)
LGFCF	0.5757*	0.7326*	1.0036**	-0.3433	0.1020	-5.5227**	0.0387	1.1490***	1.2506***	1.0227**
	(-0.0719)	(-0.0847)	(-0.0349)	(-0.5044)	(-0.8454)	(-0.0234)	(-0.9061)	(0.0000)	(0.0000)	(-0.0120)
FDIA	-0.0270	0.0161	-0.0786	-0.1216***	-0.0626***	-0.0796	-0.0934**	-0.0394*	-0.0354*	-0.0963***
	(-0.4497)	(-0.7269)	(-0.2530)	(-0.0056)	(-0.0079)	(-0.1241)	(-0.0253)	(-0.0547)	(-0.0749)	(-0.0026)
LPOPB	7.1713***	8.1351***	5.4025***	7.8585***	6.1159***	44.2856***	10.3825***	8.3685***	8.7389***	11.6304***
	(0.0000)	(0.0000)	(-0.0007)	(0.0000)	(0.0000)	(0.0134)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
INFLATION			0.0046	-0.0053	-0.0031	-0.0110	-0.0081	0.0007	0.0000	
			(-0.2862)	(-0.1919)	(-0.2329)	(-0.0574)	(-0.0585)	(-0.7636)	(-0.9826)	
LTRADE	-0.5667**	-0.3325	-1.8610***	-0.4034			-0.0317	-1.1893***	-1.1899***	
	(-0.0182)	(-0.3980)	(-0.0003)	(-0.4452)			(-0.8336)	(0.0000)	(0.0000)	
LFMD			0.1284	-0.1316				0.4750*		
			(-0.9036)	(-0.6035)				(-0.0916)		
LAID				1.1421***						
				(-0.0015)						

INFRAST		-0.1251	0.1945	-0.0570	6.7455***	-0.5173*	0.9159**			
		(-0.2310)	(-0.1786)	(-0.8427)	(0.0000)	(-0.0982)	(-0.0222)			
LCL	-0.1471*		-1.4859**		0.0411	0.1063				
	(0.0871)		(-0.0196)		(-0.7257)	(-0.6816)				
LPR	0.0231	-0.1035								
	(-0.8342)	(-0.5828)								
LTECHNOLOGY	-0.6958***	-0.7791***								
	-(0.0014)	(-0.0001)								
LGOV	-0.1320									
	(-0.9038)									
RATIOTRADEABLE*LHC							-32.558***			
							(-0.0073)			
RATIOTRADEABLE*LPOPB						-48.7516**				
						(-0.0310)				
RATIOTRADEABLE*INFRAST					-8.99528***					
					(0.0000)					
Total Panel observations	184	184	184	184	184	184	184	184	184	184
Periods included	46	46	46	46	46	46	46	46	46	46
Cross-section included	4	4	4	4	4	4	4	4	4	4
Number of instruments	11	10	11	11	10	10	10	9	8	9

Sargan test J-Stat	0.77654	1.764172	1.7049	0.9101	0.391223	1.28665	1.84206	0.3851	0.4809	1.7516
	(0.3782)	(0.1841)	(-0.1916)	(-0.3401)	(0.5317)	(0.2567)	(0.1747)	(-0.5349)	(-0.488)	(-0.1857)
Arellano-Bond Serial Correlation Test (m-stat): Test order										
AR(1)	-0.9015	-0.6533	-1.8992	-0.0846	-1.001	-0.8907	-1.7205	-0.6052	-0.7338	0.0852
	(0.3673)	(0.5135)	(-0.0575)	(-0.9326)	(0.3168)	(0.3731)	(0.0853)	(-0.5451)	(-0.4631)	(-0.9321)
AR(2)	-0.13	1.5502	-1.4154	-0.8605	0.19589	-1.4732	-1.798	-1.5816	-1.4147	-1.3702
	(0.8965)	(0.1211)	(-0.157)	(-0.3895)	(0.8447)	(0.1407)	(0.0722)	(-0.1137)	(-0.1572)	(-0.1706)
Wald Test Chi-Square	654.2007***	442.9790***	63.8185***	169.2444***	124.9458***	26.5317***	40.5149***	158.6257***	164.1537***	53.5978***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	-0.0017	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Source: Own computation using Eviews software 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. The Sargan test of over-identifying restrictions is asymptotically distributed as χ^2 under the null of instruments validity. AR(1) and AR(2) are the Arellano and Bond (1991) tests for first- and second-order serial correlation in the differenced residuals, which are asymptotically distributed as a N(0,1)under the null of no serial correlation

From the year 1970 – 2017 the study shows that economic growth of the EAC region were significantly supported by the expansion of the agricultural and manufacturing sector (i.e. tradeable output).

For instance, the result shows that a unit improvement in the ratio tradeable to non-tradeable output accounts to a significant increase in the overall economic performance of the EAC region by 1.479 units to 1.493 units. Therefore, we argue that expansion of tradeable output vis-à-vis non-tradeable output supports the economic growth of the EAC region during the study period.

The result indicates that Rwanda's economy has been supported by Karongi and Sorwathe factory, both of which engaged in tea growing and tea processing. For the case of Kenya, Orbit chemical industries limited located in Nairobi, Arkay food processing limited located in Eldoret seems to have contributed to the economic growth of Kenya. In the same vein, steel production company and Christex Garment industry (i.e., cloth manufacturing) also resulted in the economic growth of Uganda.

Finally, we argue that the production of leather, beverages chemical products, in addition to the food processing plant is attributed to the improvement of the Tanzanian economy from 1970 – 2017. However, it is imperative to note that non-tradeable sector does not support the economic growth of the EAC region, and our argument is that influence of non-tradeable output on the performance of overall EAC economy could be outweighed by the positive effect of tradeable output on economic growth. For instance, the export of EAC regions to the US among other countries tends to be raw or semi-processed agricultural products. Therefore, providing the EAC regional economies foreign exchange revenue.

Moreover, Table 3.12 indicates, an increase in the ratio tradeable output to non-tradeable output in the presence of human capital reduces the significant effect of tradeable output on economic growth. We argue that since human capital supports the non-tradeable sector relative to tradeable output as seen reflected in Table 3.12, this implies any investment in the human capital benefits the non-tradeable sector rather than the tradeable sector. Hence the performance of tradeable output on EAC regional economic growth is reduced in the presence of human capital is reduced.

Similarly, Table 3.12 suggests an increase in the ratio tradeable output to non-tradeable output significantly reduces the economic performance of the EAC region during the study period in the presence of infrastructure. Again, Table 3.12 indicates that improvement of

infrastructure results into significant reduction of tradeable output to non-tradeable output. Because infrastructure supports the expansion of non-tradeable output, the interaction between infrastructures with tradeable output is negative. (i.e. the inverse relationship between infrastructure and expansion of tradeable output).

Furthermore, result from Table 3.12, report that the EAC region has significantly benefited from the expansion of tradeable output to non-tradeable out in the presence of labour force availability. The findings suggest that although labour force availability results into expansion of non-tradeable output vis-à-vis tradeable output as reflected in Table 3.12. In the context of overall economic performance, expansion of tradeable output relative to non- tradeable output is significantly supported by labour force availability in the EAC region from 1970 – 2017.

Consider result from Table 3.10 it shows that FDI inflows to the EAC region had zero effect on economic growth. Also, that this FDI inflows resulted in a reduction of tradeable to non-tradeable output. In other words, FDI inflows led to the expansion of non-tradeable output, as seen in Table 3.10. Also, as seen in Table 3.12, although FDI inflows benefited the non-tradeable sector, it seems that in terms of economic significance, the tradeable sector is critical for the economic growth of the EAC region. From a policy standpoint, FDI inflows need to be directed to the tradeable sector (i.e. agricultural and manufacturing sector) as it has a significant favorable influence on economic growth from 1970 – 2017.

Our empirical analysis suggests that expansion of agricultural sector results into the improvement of economic growth of the African economies (Adesoye et al. 2018; Dike, 2018, Sertoglu et al. 2017; Eddine (2010). Moreover, manufacturing output also supported the economic performance of the African countries during the study (Tsoku et al., 2017).

A study by Tregenna (2008) also found that the service sector also positively contributed to the growth of South Africa. Moreover, as a share of share relative to GDP increase, the effectiveness of the manufacturing sector on economic growth steadily decline. In the context of our study, we also found the expansion of tradeable output relative to non-tradeable output is attributed to the economic progress of the EAC region from 1970 – 2017.

Moreover, in terms of vectors of control variables, the results in Table 3.12 are like those of Table 3.6. For instance, Table 3.6 results indicate that an increase in the domestic investment, and labour force availability and aid variables significantly results into the improvement of economic growth of the EAC region from 1970 – 2017. In addition, human capital, infrastructure supports economic growth while financial sector development barely had any effect on economic growth

as seen in Table 3.12, model 8. Conversely, empirical estimate shows that trade liberalization, technology gap significantly reduces economic growth during the study period.

While political right and inflation variables had zero effect on growth, civil liberty had significant reduction on economic growth

3.8 Conclusion and policy recommendations

The conclusion and policy recommendations are guided by our research questions and growth empirical literatures, as in addition to theoretical discussions. In Chapter 3 we had subsection in our growth chapter, we provided conclusion and policy recommendations under each subsection.

We started by presenting conclusion and policy recommendation relating to question – Does FDI contribute to the overall economic performance of the EAC region and role of FDI on the ratio tradeable output to non-tradeable output?

We also forwarded conclusion and policy recommendations on research question pertaining – Does what is the contribution of ratio tradeable output ton non-tradeable output on the economic growth of the EAC region?

Does FDI contribute to the overall economic performance of the EAC region?

3.8.1 Conclusion (effect of FDI on economic growth at aggregate level)

We also attempted to provide an answer concerning the overall contribution of FDI to the economic performance of the EAC region. In so doing, we adopted the Solow (1965) growth model as our analytical tool and applied the generalised difference method of moments (DGMM) estimation technique. The advantage of using DGMM has pointed out in the thesis is that it allows us to control for endogeneity in the model. Therefore, our empirical results indicate that FDI benefited the EAC region from 1970 – 2017, this concurs with earlier studies (Epaphra and Mwakalasya, 2017; Munyanyi, 2017; Jilenga et al., 2015). We observe that the volume of FDI to the host countries plays a vital role, for such FDI to have any significant positive effect on the economy. In context of the EAC region, we observed that FDI had zero effect on the economic performance of the region at a macro level. We attributed zero effect of FDI on the economic growth of the EAC region to the small volume of FDI received by the region.

Furthermore, we also found that domestic investments and labour availability significantly contributed to the economic growth of the EAC region. Conversely, trade liberalisation and existence in the technology gap between the EAC region and the world-leading country (the US) have significantly reduced the productivity of the EAC region. Elboiashi (2015) also found that technology gap that existed between developing economies and the US resulted in the reduction of the economic output of the developing countries. Moreover, Boresztein et al. (1998) also noted that countries with underdeveloped human capital could lower the productivity of foreign and local investors capitals.

Our studies also suggest that in the presence of trade liberalization and human capital, the effect of FDI on economic growth is zero.

3.8.2 Policy recommendation

According to our analytical framework, the inflows of FDI to the EAC region is expected to support economic growth. Therefore, we recommend that the EAC region should adopt policies that attract large volume of FDI to the EAC region. As reflected in our empirical findings, attracting the small volume of FDI does result to zero economic benefit to the EAC region. In other words, FDI does not support the economic performance of the EAC member states.
Therefore, we recommend that the EAC region should provide tax incentives if they are to attract more FDI. For instance, our analysis on the World Bank data shows that, in the year 2017, the taxes on income, profits, and capital gains (% of total taxes) among the EAC member countries varies. We noted that Tanzania had the least tax rate at only 33.71%. It is not surprising that Tanzania received the highest amount of FDI in the same year and witnessed the highest annual growth rate of 6.79%. We posit that low taxes makes sense since it would attract foreign investors in the form of FDI, in addition to incentivising domestic actors to engage in economic activities, thereby, positively affects the economic growth of the country.

Moreover, we also encouraged the EAC regional member countries to revise policies that encourage commercial agriculture. Given that agriculture is the main economic activities in the EAC region and the largest employer of the EAC citizenry. Also, analysis on sectoral effect on economic growth indicates that expansion of tradeable support's economic performance of the EAC region. So, changes in policies needs to support crops and livestock ranching should be promoted. For instance, the EAC member states should provide large actors of land for both crops production and livestock keeping. We also recommend that the arable land should be left entirely

for farming and uncultivated land to be used for livestock raring and setting up manufacturing facilities. Moreover, the government should offer cheap credit facilities to farmers in the short-run. However, in the long-run government should lower taxes to encourage savings and credit cooperatives *(*SACCOs) that are active in the five EAC member countries.

For example, World Bank data indicates that the EAC region has enough Arable land to accommodate both foreign and domestic investors. In the year 2017, data shows that Burundi and Rwanda have the most significant percentage of arable land (i.e. arable land % of total land), which stood at 46.73% and 46.68%. Burundi and Rwanda's arable land were much higher than those of Kenya and Tanzania, which were registered at 10.19% and 15.24% respectively.

We also recommend that the EAC member governments increase public-private partnership (PPP). For instance, by involving private partnership, it increases government efficiency to acquire large pieces of land for commercial farming. Also, we recommend leasing large hectors of land for commercial farming to foreign investors at affordable fees, provided there is more significant positive spillover from foreign farmers to local farmers. The positive spillover can be through sharing good farming practices with higher crop yields.

We also note that political stability is critical for the EAC region to receive FDI. For instance, among EAC member countries, Tanzania is one of the most peaceful and politically stable countries. Therefore, it is not surprising that Tanzania continues to enjoy a considerable amount of FDI. Moreover, we also found that FDI crowds out domestic investments.

We recommend that the EAC member states should invest in human capital. Borensztein et al. (1998) reported that the country could only benefit from human capital when the human capital as attains minimum threshold. According to Romer (1986), the benefit of augmented labour is the increase in labour productivity. According to our empirical results, because the EAC region has low human capital, not ready to use advanced foreign technology. We see that in the presence of human capital, that is unproductive, we see the insignificant negative effect of FDI on the economic performance of the EAC region.

Research question – does an increase in FDI results into the expansion of the ratio tradeable output to the non-tradeable output in the EAC region?

3.8.3 Conclusion (effect of FDI on the ratio tradeable to non tradeable output)

Lartey (2017) studied the effect of ratio tradeable output to non-tradeable output on the forty-four emerging and developing countries from 1990 –2006 and adopted a GMM estimation technique. Lartey further examined the effect of ratio tradeable output to non-tradeable output on the exchange rate and found that FDI results in an expansion of non-tradeable output, which also results in exchange rate appreciation. We followed the Lartey study and also found that FDI results in the expansion of non-tradeable output (sector) vis-à-vis tradeable output. However, we found zero effect of FDI on ratio tradeable to non-tradeable output. we attributed the zero effect of FDI on the ratio tradeable to non-tradeable output on a small volume of FDI to the EAC region. Most vectors of control variables had significant effet on the dependent variable. For example, we found that domestic investment, labour force availability (unskilled labour) and technology gap resulted in the expansion of non-tradeable output vis-à-vis tradeable output. It appears that in the non- tradeable output (i.e., service sector) the technology gap between the EAC region and the US, which is the technology leading economy is not huge compared to tradeable output.

3.8.4 Policy recommendations

We recommend that the EAC member states should liberalise and deregulation of service (non-tradeable sector) for foreign investors. For instance, in the presence of trade liberalisation, FDI inflows to the EAC region had zero effect on the ratio tradeable to non-tradeable output. Therefore, we argue for increased trade liberalisation in the non-tradeable sector, as it might encourage more FDI to the sector (i.e., service sector). Also, increased investment to tthese sector by specifically foreign investors could benefit the tradeable sector. For instance, the FDI in the non-tradeable sector may have a positive effect on the productivity of the local manufacturing firms in the EAC region. This supported by existing empirical literature which argues that FDI in service sector increases the productivity of domestic manufacturing firms through reduction of costs, increasing the variety, availability as well as better quality of inputs (Bourlès et al, 2013; Fernandes & Paunov, 2012; Arnold et al., 2011; Barone & Cingano,

2011; Oulton, 2001).

Furthermore, Arnold et al. (2011) studied the effect of services liberalisation, privatisation and FDI penetration. Arnold et al. (2011) further examined the effect of competition in the services sector in the Czech Republic. They found a significant positive effect of the services FDI on the productivity of downstream manufacturing local firms. Although Arnold et al. case study involves this Czech Republic, we expect the same effect in the EAC region because both countries are not characterised as developed economies, although the Czech Republic is within higher income bracket. (World Bank, World Development Indicator database, 2019).

We also recommend that the EAC member countries should also encourage more FDI to the tradeable sector (manufacturing and agricultural sector). Result from Table 3.12 indicates that expansion of tradeable sectors significantly supports economic growth of the EAC region during the study period. Therefore, the significant positive effect of the FDi net-inflows(% of GDP) to the tradeable output as well as non-tradeable output could be explained by the high volume of FDI inflows to these sectors. Also, significant effect of FDI to non-tradeable secto vis-à-vis tradeable sector could be explained by much of FDI received in the sector.

Does improvement of tradeable output relative to non-tradeable output results in the economic growth of the EAC region?

3.8.5 Conclusion (effect of the ratio tradeable to non-tradeable output on growth)

Furthermore, unlike Lartey (2017), we also examined the effect of ratio tradeable output to non-tradeable output in the EAC region. We found that the growth of the EAC region comes from the tradeable sector. In other words, the manufacturing and the agricultural sector combined were responsible for the growth of the EAC region from 1970 –2017.

Moreover, we also found that human capital, presence of labour force, institutional quality, political stability, and good infrastructure supports the economic growth of economic performance of the EAC region. However, we found that the expansion of ratio tradeable to non-tradeable output, in the presence of human capital, labour force, infrastructure, it hurts the economic progress of the EAC region. According to Borezstein et al. (1998), we argue that the EAC region still has poor infrastructure and human skill base (i.e., productivity of labour-force and skill labour seems the same). Also, unfortunately, when FDI inflows is included in the model, it turns to have a significant adverse effect on growth, alongside technology gap and trade liberalisation. In conclusion, North (1990) posit that countries with sound institutions quality characterised by low corruption, the rule of law, voice and accountability, good regulatory quality, government effectiveness and political stability and absence of violence, that these countries would witness economic growth. North (1990) further stated that institutional quality unleashes entrepreneur potential of the economy. Therefore, reducing technology gap between developed and eveloping economies through engagement in research and development leading to innovation. This because countries with well developed institutional quality act as an incentivise for entrepreneurs to undertake research and development (R&D) resulting in product and process innovation.

3.8.6 Policy recommendations

We recommend the EAC region to attract market seeking FDI. The advantage of the market-seeking FDI lies on the fact it uses predominately more of local resources to produce goods and services to serve the domestic market. This type of foreign investors needs to be directed

to the tradeable sector (agriculture and manufacturing sector). Beugelsdijk et al. (2008) also demonstrate that horizontal FDI (market – seeking FDI) exerts more pressure on the economic growth of the host country than vertical FDI (efficiency-seeking FDI).

According to secondary dataset we obtained and analysed from the Bank of Uganda, Bank of Tanzania and National Bank of Rwanda, most FDI to the EAC region went to the service sector. We argued that due to the high volume of FDI going to the service sector (non-tradeable sector), it resulted in the expansion of non-tradeable sector vis-à-vis tradeable. Our empirical estimates concur with Alfaro's (2003) results that, amonbg other sectors o f the economy, the manufacturing sector significantly exert more pressure on economic growth.

Furthermore, Alfaro (2003) found the primary sector do have a significant negative contribution to growth. In the context of the EAC region, we argued, agriculture, considered as the primary sector, would have a positive effect on economic growth conditioned on government educating farmers to undertake commercial farming. The EAC regional governments can encourage more farmers to adopt modern large-scale farming through the provision of financial assistance to medium and large-scale farmers. We argue that financial assistance would enable farmers to acquire modern farming equipment and expertise (i.e., use of fertilizers and irrigation). However, given the potential of moral hazards and information asymmetry that might exist in the process of awarding financial assistance to the beneficiary (i.e. farmers), the problem might be mitigated by government agency dealing with the medium and large-scale registered farmers — and buying them farming equipment instead of giving money.

Borenezstein et al. (1998) noted that the development of human capital is needed as it increases the absorptive capacity of the developing countries. Therefore, we believe that training farmers with modern farming methods would increase their productivity (Arrow, 962). The increased agricultural products can be semi-processed and exported to the US, where the EAC region enjoys preferential access to the domestic market. The framework Known as the African Growth and Opportunity Act (AGOA).

Therefore, we believe that improving the productivity of the tradeable sector would promote the economic growth of the EAC region. Furhermore, given the interdependence between the manufacturing sector and agricultural sector, there is potential of reverse causality between manufacturing and agricultural sector. Also, these sectors are dominant in terms of employment. Therefore, given the substantial arable land in the EAC region, promoting the tradeable sector would improve the economic performance of the EAC region. Result in Table 3.12 indicates that

expansion of tradeable out (manufacturering and agricultural output) significantly supports economic growth.

Furthermore, Masron et al. (2012) noted that FDI has enormous productivity spillover in the manufacturing sect. This could be because in the manufacturing sector, advance production technology and skilled personnel are used (Borenezstein et al. 1998). Therefore, because an educated workforce is quick to learn, share knowledge and innovate. It explains why there are more knowledge and technology transfer in the manufacturing sector where foreign firms are present.

In the context of the EAC region, manufacturing sectors consume the most significant proportion of the agricultural output. Therefore, we expect inter-industry positive productivity spillover from the manufacturing sector to the agricultural sector. As advance imported machine equipment is mostly employed in the manufacturing sector – which requires re-skilling employees through training, resulting into high volume of quality agricultural outputs to be used in manufacturing sector. Also, to achieve optimal production in the manufacturing sector, the foreign manufacturing entrepreneurs are should be incentivised to transfers their skills such as; storage and production knowledge to the local farmers (suppliers) hence improving their productive capacity (Alcacer and Oxley, 2014; Alfaro and Rodrigues-Clare, 2004; Jovorcik, 2004).

Therefore, we recommend the EAC regional government to reduce taxes on essential manufacturing equipment. More importantly, we observed that trade liberalisation did not benefit the EAC region. The trade deficit occurs because of the EAC region exports raw agricultural outputs (dominate economic activity) and expensive import machinery and processed agricultural products). In this context, the EAC region should adopt and implement policies to restrict advance but cheap imported products, mainly from China. The idea is to give support to infant manufacturing industries to develop. We argue that deterring cheap imported goods can be achieved by imposing higher tariffs and quotas on imported products, specifically those goods that can be domestically produced.

In conclusion, the EAC region should support the tradeable sector since it supports economic growth. Besides, it will also improve skill bases on the EAC citizenry and well as guaranteeing food security. Salimane et al. (2016) noted that food security would be guaranteed in developing countries because of the presence of foreign direct investment. The idea is that foreign investors come with new farming equipment and expertise. Moreover, it has needed capital to undertake large scale farming. In this context, we encourage the EAC regional government to attract FDI to the agricultural and manufacturing sector.

Chapter Four

4.1 FDI and income convergence

Our Chapter four present discussion on the empirical literature on convergence. We have presented empirical evidence on income and FDI convergence in the EAC region. We particularly wanted to examine the role of FDI on the income convergence in the EAC region. Here we used total FDI and bilateral FDI from the UK to the EAC region (i.e., Uganda, Kenya, Tanzania and Rwanda). Burundi was left out of the study due to unavailability of data.

Besides, we also reported summary of our descriptive statistics and instrument variables for our model specifications. We use Solow growth model as our analytical framework. For the discussion of the economic model (refer to Chapter Three, methodology and empirical section 3.3). In addition, we provided our empirical models and results, and concluded with brief concluding remarks and policy recommendations.

Our review of literatures on convergence suggests that there many ways to measure convergence. For instance, Genc et al. (2011) reported four primary empirical techniques to test for convergence. That we can test for sigma convergence, absolute and conditional beta-convergence as well as stochastic convergence. Moreover, Wei (2001) classify convergence into two group based on Loewy and Papell (1996) study. That the first group entails cross-section convergence. This convergence type includes studies relating to beta and sigma convergence.

The second group relate to time-series or stochastic convergence. Wei et al. (2001) noted that pioneers of stochastic convergence are Evans and Karras (1996) and Bernard and Durlauf (1996, 1995). Wei further indicates that economy meets stochastic convergence conditioned on the presence of cointegration among time series. Moreover, Wei observation based on Evans and Karras (1996) and Bernard and Durlauf (1996, 1995) studies indicate that convergence happens when countries share long-run trend either deterministic or stochastic.

In context to our study, our analysis on the role of Foreign Direct Investment (FDI) on income convergence supports the notion that FDI plays an important role in facilitating income convergence in the EAC region. We also discussed two growth theories (exogenous and endogenous growth theories). The neoclassical growth theories relate to absolute convergence while endogenous growth theory is linked to conditional convergence. For the discussion of these growth theories refer to section Chapter Three.

We use Solow growth theories to assess the contribution of FDI on income convergence of the EAC region. The concept income convergence suggests that countries with lower income

level tend to grow faster than those with higher income level, signifying a catch-up process (Xavier and Sala-i-Martin, 1996; Abramovitz, 1986).

In context to the EAC region, Burundi which is poorest based on income level should grow faster than Kenya, a country with highest income level in the region. Whereby, in the long- run poorer EAC member countries should catch up with Kenya, a high-income country. Wei et al. (2001) notes that there mainly two convergence hypotheses which are absolute and conditional convergence. We have attempted to discuss them in context of EAC region.

4.1.1Absolute convergence (Neoclassical Growth Theory)

In our discussion of absolute convergence, we applied neoclassical growth model (Solow (1956) growth model). The concept absolute income convergence indicates that, irrespective of a country or region's initial income, that the per capita income levels of countries are expected to converge (Barro and Sala-I-Martin, 2004). We expect to see the EAC region that is homogenous countries to converge to the same steady state income level.

To explain absolute income convergence process in the EAC region, we based our discussion on Solow's growth theory by mathematically following recent paper on convergence (Ma and Jia, 2015). Ma and Jia started by presenting equation (4.1) below.

$$\text{Log}\,(Y(t)) = (1 - e^{\beta t}).\log\,(Y^{*}) + e^{-\beta t}.\log\,(Y(0)) \qquad (4.1)$$

Note, symbol Y represent variables at levels while log(Y) which can also be written as y shows transfomed Y varible.

Therefore, in this study, Y denote per capita income, while Y^{*} reflects the value of the economy's steady state of income and so, the speed of convergence for an economy is captured by β. Specifically, the convergence speed measures the speed at which Y converges towards its steady state of Y^{*}.

Now when we solve for Y^{*}in equation (4.1), our convergence model can now be written as seen in equation (4.2)

$$\frac{1}{T}\log\left[\frac{Y_{iT}}{Y_{i0}}\right] = \beta - \frac{1-e^{\beta t}}{T}\log\,(Y_{i0}) + \mu_{i0} \qquad (4.2)$$

From equation (4.2) whereby, we show that the left-hand side of equation is the average growth rate of output (Y) from time of 0 and T while Y_{i0} and Y_{iT} denotes initial per capita income and final per capita income of the region respectively. Moreover, Ma and Jia (2015) suggest

equation (4.2) be rewritten as seen equation (4.3).

$$\text{Log}\,(Y(t)) = (1 - e^{\beta t}).\log\,(Y^{*}) + e^{-\beta t}.\log\,(Y(0)) \qquad (4.3)$$

Ma and Jia (2015) and Greene, (2007) both observed that the equation (4.3) is normally applied when estimating cross-section data model. Further, that the advantage of using panel data model as the case for our study is that it tends to be consistent with economic growth theory and capable of solving biasness in the estimation.

Therefore, in our study, based on Ma and Jia (2015), the estimation of absolute income convergence using panel data model can be presented as seen in equation (4.4)

$$\text{Log}\,\left[\frac{Y_{it}}{Y_{i,t-1}}\right] = \beta\, -\, (1 - e^{\beta t}).\log\,(Y_{i,t-1}) + \mu_{it} \qquad (4.4)$$

From equation (4.4), the $\log\left[\frac{Y_{it}}{Y_{i,t-1}}\right]$ denotes the annual growth of the per capita income.

4.1.2 Conditional convergence (Endogenous Growth Theory)

In context of conditional convergence, we found that endogenous growth theory augment neoclassical growth model by introducing critical independent variables which are deemed useful in explaining convergence process.

First, we start by stating that conditional income convergence hypothesis indicates that countries are able to converge to same income level in the long run conditioned of them sharing similar structural characteristics, among them are human capital, same population growth rate, and the institutional quality (Murtala and Sallahuddin, 2015; Wei et al., 2001).

In our study, since we are assessing the role of FDI on income convergence, our key variable is FDI. This is because FDI is critical for economic progress of the EAC member states. This because FDI is the most efficient instrument of technological transfer from rich to poor countries thereby, speeding up economic growth of poorer economies. Therefore, model (4.5) is modified model (4.4) hence accounting for FDI.

$$\text{Log}\,\left[\frac{Y_{it}}{Y_{i,t-1}}\right] = \beta -= \,(1 - e^{\beta t}).\log\,(Y_{i,t-1}) + \beta\,\log\,(FDI_{i,t}) + \mu_{it} \qquad (4.5)$$

Based on theoretical discussion, we can clearly see distinction between absolute and conditional convergence. What the above discussion indicates is that it is possible for a country or region to diverge instead of converging. In addition, most empirical papers on income convergence have also discussed beta and sigma convergence. They denote β for (Beta) – convergence and $\sigma$for

sigma – convergence.

Further, because we have captured these two concepts when examining the role of bilateral FDI to the Four EAC member countries (Uganda, Kenya, Tanzania, and Rwanda). We provide discussion on the beta and sigma convergence by closely following the working of Xavier and Sala-i-Martin (1996). Xavier and Sala-i-Martin provided very detailed analyse of β (Beta) – convergence and σ(sigma) convergence as discussed below.

We start by noting that the two tools used to test for convergence hypothesis according to Xavier and Sala-i-Martin (1996) are known as beta (β) convergence and sigma (σ)convergence. We note that although the concept of β – convergence and σ – convergence where first introduced by Sala-i-Martin (1990), these concepts gained prominence in numerous studies. For instance, studies by Baumol (1986), Barro and Sala-i-Martin (1992) have all utilised β – convergence tool to examine presence of convergence among countries. According to Barro and Sala-i-Martin, we say there is absolute β – convergences when developing (poorer) countries are growing faster than rich countries (Xavier and Sala-i-Martin, 1996). To be precise, when poorer countries are growing much faster than rich economies, then initial income level – growth rate relationship should be negatively correlated.

Therefore, β – convergence helps us to measure movement of individual countries across within a given world's income. However, the concept σ – convergence simply reveal to us whether the cross-country income distributing is expanding or shrinking (Xavier and Sala-i-Martin, 1996). In other word, σ – convergence is when group of countries are converging considering σ (sigma), and so, the dispersion of their real GDP per capita levels should be falling over time.

By following Xavier and Sala-i-Martin (1996) discussion on income convergence, imagine that the annualised GDP per capita growth rate between period t and $t+T$ of country i's presented as $Y_{i,t,t+T}$ which is equivalent to log $(Y_{i,t,t+T}/Y_{i,t})/T$. In addition, the country i's per capita GDP in logarithm in time t presented as log($Y_{i,t}$) – here we are measuring absolute convergence. For instance, rewritten equation (4.1) below is our equation (4.6).

$$Y_{i,t,t+T} = \beta - \beta log\left(Y_{i,t}\right) + \mu_{i,t} \qquad (4.6)$$

When we estimate equation (4.6) and the coefficients $\beta > 0$, according to Xavier and Sala-i-Martin, the analysis should base on the interpretation of presence of absolute β – convergence.

Consider equation $\sigma_{t+T} < \sigma_t$, where $\sigma_t$denote the time t standard deviation of log $(Y_{i,t})$ across i. We can see relationship between β – convergence and σ – convergence. For instance, according to Xavier and Sala-i-Martin, in equation (a), when we take sample variance of log($Y_{i,t}$) we obtain

the relationship between $\sigma_{t+T}\ and\ \sigma_t$ which depend on β. This is because the difference between log($Y_{i,t,+T}$) and log($Y_{i,t,}$) divided by T represent the growth rate of an economy. In nutshell, we can see that when GDP levels of two or more countries become similar, it should be the case that the poorer countries with lower initial GDP levels grow faster vis-à-vis those with higher initial GDP level.

We note that we have not carried out sigma convergence because our main interest is to find out whether the EAC member countries were heading towards long-run steady state with respective to income. Moreover, it is beyond the scope of this analysis as we are constraint by time.

4.2 Empirical literature review on income convergence.

We have analysed the empirical literature pertaining income convergence. We focused more on the developing countries. For instance, Jawid and Raza (2012) examined income convergence within low, middle- and high-income countries. Jawid and Raza study period ranged from 2003 – 2009 and applied the Ordinary Least Square estimation. Low income, middle- and high-income countries consist of fifty-seven, thirty-three, and thirty-nine countries, respectively. Jawid and Raza empirical results show the presence of absolute convergence for three income groupings. Indicating that low-income countries are catching up with high-income countries during the study period. However, although FDI supports the process of income convergence, Jawid and Raza's study reveal conditional beta-convergence for low-income countries was weak. The weakness might be that poorer countries do not have the absorptive capacity required to facilitate FDI in speeding up income convergence.

In Africa, Dune and Masiyandima (2017) and Kumo (2011) both focused their empirical investigation on beta income convergence in the South African Development Community (SADC). Dune and Masiyandima (2017) and Kumo (2011) study period includes 1981 to 2011 and 1992 to 2009, respectively. Dune and Masiyandima study which adopted REM and FEM found the presence of both absolute and conditional beta income convergence in the SADC region. However, Dune and Masiyandima reported that countries that received more FDI from South African experience higher beta conditional income convergence. Dune study suggests that poorer countries within SADC countries could be catching up with more prosperous country (South Africa).

On the other hand, Kumo (2011) which adopted Generalized Least Square from OLS residuals. The Kumo's estimation shows presence of both absolute and conditional beta income convergence in the SADC region during the study period. However, the estimated coefficients for absolute and conditional coefficients were statistically insignificant. Furthermore, Kumo reported that the

SADC region from 1992 to 2009 witnessed per capita income disparity (Sigma disparity), and it is also statistically insignificant.

Recently, Asongu (2014) study seems to adopt Jawid and Raza methodology by study income convergence among regional groupings. For instance, Asongu's study examined income convergence of thirty-eight African countries. These African countries were divided into North and Sub-Sahara African countries. Furthermore, the countries were subdivided based on religion (Christina or Muslim) or Language (English or French). The study period covered 1981 to 2009, and DGMM estimation technique was utilised. The result shows that absolute and conditional beta-convergence in North African countries to be higher than those of SSA countries. Asongu further indicates Countries that are predominantly Christians and English speaking witnessed greater absolute beta income convergence than Muslim and French-speaking countries. We observe that the study seems reliable as diagnostic tests such as serial correlation, use of right instruments and Wald test are carried out.

Van Le and Nguyenb (2018) examined whether eighteen provinces in Vietnam experienced income convergence from 2000 – 2015. The result from Random effect estimation suggests that eighteen provinces in Vietnam witnessed growth convergence (Beta convergence). However, during the same year, Van Le and Nguyenb study show the presence of insignificant per capita income disparity (Sigma disparity). Moreover, Van Le and Nguyenb reports that during trade liberalization period of 2006 – 2015, the eighteen provinces, there was a presence of Sigma convergence. Therefore, Van Le and Nguyenb results point out the importance of FDI in speeding up the convergence process in Vietnam. Finally, the study further shows, from 2000 to 2005 (pre-trade liberalization period); 2006 to 2015 (trade liberalization period) and 2000 to 20015, there was no absolute beta convergence. We note that the study period is too short of providing meaningful results. None the less, for convergence to occur in the eighteen provinces in Vietnam, growth accounting variables such as FDI developed infrastructure, and human capital is required.

Vollmecke et al. (2016) looked at whether two hundred and sixty-nine (269) European region witnessed income convergence from 2003 to 2010. Vollmecke et al. reported that they applied a Markov chain approach of which they argued do control regional specific dynamics. Vollmecke et al. reported weak income convergence for European region under study. However, they found that the poorer Central and Eastern European countries (CEECs) region enjoyed faster growth rate. Moreover, there was evidence that FDI supported income convergence. We conclude that FDI contributed to the catch-up and regional income convergence. According to Ramona et al. (2017) study, they found that FDI has contributed positively to the income convergence of Bulgaria and Romania from 2004 to 2014. They use simple OLS estimation technique in their

study.

In addition, Gutiérrez-Portilla et al. (2015) studied income convergence within Spanish NUTS-2 regions. Gutiérrez-Portilla et al. study period range from 1996 – 2013 and involve panel data Spatial Durbin model estimation technique. Gutiérrez-Portilla et al. argued that using the estimation would allow for incorporation of spatial dependence in the process of growth analysis. Gutiérrez-Portilla et al. reported that the study shows the presence of conditional beta income convergence among Spanish region during the study period. However, we observed that FDI led to Spanish regional income disparity during the study period. Gutiérrez-Portilla et al. further noted, the region with higher human capital benefited from FDI hence experienced a higher growth rate. In the same year, Chapsa et al. (2015) studied growth convergence of Greece, Ireland, Portugal and Spain from 1995 to 2013. Chapsa et al. results based on SGMM technique show a significant presence of conditional beta income convergence. However, they pointed out that FDI had an insignificant role in supporting income convergence during the study period.

Workie (2005) examined income convergence in the Central and Eastern European countries after the fall of the Soviet Union. The study period covers the year 1990 to 2000. Workie adopted REM and FEM estimation technique and divided study sample into four. EU fifteen comprise of richer European countries such as the UK, while EU thirteen compose of transitive countries, among them Russia and Turkey. While accession countries were made of six countries like Slovakia and Finally Visegrad Four are made of four countries like Poland among others. Workie results show all the four-sub region enjoyed conditional beta income convergence. However, Workie noted that poorer countries experience higher growth than rich countries. Workie also reported that although the contribution of FDI to income convergence was insignificant for the Visegrad four countries, for the rest of the countries it was significant.

4.3 Empirical equation and results

In this section, we examined whether the EAC member countries were converging in terms of the FDI inflows, income growth rate gap and the income level. We assessed the influence of crucial variable, FDI informs of total and bilateral FDI on the economic growth rate and per capita income level. We tested the presence of absolute convergence, conditional convergence and stochastic convergence. To fulfil our objective, we estimated equation (4.7). Our study period range from 1970 –2017. Also, Table (4.4) and (4.8) report information on both the absolute and conditional growth rate income convergence of the Five EAC member countries.

$$Y_{i,n} = \propto + \theta Y_{i-1} + \sum_{k=1}^{k} \emptyset_k X_{i,k,n} + \varepsilon_{i,n} \quad (4.7)$$

From equation (4.7) above, our dependent variable $Y_{i,n}$ is growth rate to country i in year n. Y_{i-1} Captures the income (growth rate of per capita income) convergence associated with country i in year n. On the right-hand side of the equation are our regressors. $\emptyset_k X_{i,k,n}$ is the kth control variable associated with country i in year n. The control variables included in the equation (a) are as follows: (1) Policy variables, comprised of inflation, FDI net inflows as % of GDP, Domestic investment, financial crisis, trade liberalization. (2) Institutional quality variables made of human capital, population size (age 15 – 64) and technology gap. (3) Political risk variables proxy by the political right and civil liberty variables. Finally, $\varepsilon_{i,n}$ is the disturbance term (i.e., error term) which can be heteroscedastic. Table 4.1 below show the variables used in this section.

Table 4.1 shows variables where our dependent variable is the ratio tradeable output to non-tradeable output, and the key independent variable is FDI net inflows (% of GDP).

Variable	Definition	Measurement	Source
GDP_PCGROWTH	Annual GDP per capita growth rate	Economic growth/income	UNCTAD
FDIA	Foreign Direct Investment net	FDI inflows	World Bank,
GFCF	Gross fixed capital formation	Domestic	World Bank,
HC	School enrolment, primary (%	Human capital	World Bank,
TO	Trade (% of GDP)	Trade Liberalization	World Bank,
FIN_CRISIS	Financial crisis	Global financial	World Bank,
INFRAST	Fixed telephone subscriptions (per 100 people)	Telecommunication Infrastructure	World Bank, WDI database
CL	Civil liberty	Freedom status	Freedom House
PR	Political right	Freedom status	Freedom House

Table 4.2 shows descriptive statistics for the Beta convergence in the EAC region for 1970 – 2017

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
CL	5.1667	5.0000	7.0000	3.0000	1.1116	240
FDIA	2.4958	0.3828	320.1000	-0.7978	20.6445	240
GDP_PCGROWTH	1.5108	1.6386	36.9809	-47.8056	5.5310	240
TO	41.9558	41.6440	74.5734	16.9511	12.3304	240
GFCF	18.0393	17.4327	34.2518	2.7811	6.9175	240
FIN_CRISIS	0.0208	0.0000	1.0000	0.0000	0.1431	240
INFRAST	0.3355	0.2518	1.6510	0.0320	0.2814	240
PR	5.5792	6.0000	7.0000	3.0000	1.1724	240
HC	85.3335	82.5349	148.1242	21.5813	31.3817	240

Source: Own computation using EViews 8 (x64)

Table 4.3 shows instrument variables used in the study of total FDI and income Beta convergence from 1970 – 2017 (see Table 4.4).

Model	Instruments model specifications
1	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF INFRAST LTO(-2) LCL FIN_CRISIS(-1) HC
2	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF FIN_CRISIS(-1) INFRAST LTO(-2) LCL
3	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF FIN_CRISIS(-1) INFRAST LTO(-2) LPR
4	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF FIN_CRISIS(-1) INFRAST LTO(-2)
5	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF(-1) FIN_CRISIS INFRAST (-1)
6	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2)FDIA(-1) LGFCF(-1) FIN_CRISIS
7	LGDP_PCGROWTH(-1) LGDP_PCGROWTH(-1) GDP_PC(-2) FDIA(-1) LGFCF(-1)
8	GDP_PCGROWTH(-1) GDP_PCGROWTH(-2) FDIA(-1) LGFCF(-1)
9	LGDP_PCGROWTH(-1) LGDP_PCGROWTH(-1) GDP_PC(-2) FDIA(-1)
10	LGDP_PCGROWTH(-1) LGDP_PCGROWTH(-1) GDP_PC(-2)

Source: Own computation using EViews 8 (x64). The selection of right instrumental variables use in the model are based on Sargan test. The Sargan test has a null hypothesis (Ho) that the instruments as a group are exogenous. Therefore, the higher the p-value of the Sargan statistic the better. This means our selected instruments are appropriate for the estimated model.

4.3.1 FDI and Income convergence (Beta Convergence) Empirical results

We have presented our empirical results on beta (β) income convergence for the EAC region. The countries involved in the study were, Uganda, Kenya, Tanzania, Rwanda and Burundi, and our study period span from 1970 – 2017.

Table 4.4 below is our empirical evidence on (β (beta) income convergence for the EAC region.

Table 4.4 Shows the EAC income convergence for the year 1970 -2017, and the dependent variable is economic growth.

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
LGDP_PCGROWTH (-1)	-0.3731**	-0.3683**	-0.3813**	-0.3755**	-0.6390***	-0.6393***	-0.3253**	-0.2734*	-0.3342**	-0.3387***
	(0.0428)	(0.0414)	(0.0266)	(0.0315)	(0.0011)	(0.0012)	(0.0119)	(0.0855)	(0.0081)	(0.0062)
FDI	0.1474	0.1344	0.1287	0.1253	0.5208	0.5228	1.1892	0.4038	1.2119	
	(0.6065)	(0.6350)	(0.6401)	(0.6508)	(0.2337)	(0.2352)	(0.3805)	(0.4215)	(0.3751)	
LGFCF	5.3459	5.5968	5.5079	5.9031	88.9939	90.0296	2.2975	-5.5778		
	(0.3962)	(0.3587)	(0.3572)	(0.3152)	(0.2883)	(0.2779)	(0.6507)	(0.4763)		
FIN_CRISIS					-5.6971	-5.8098				
					(0.5269)	(0.5216)				
INFRAST	4.1927	5.2622	4.5715	4.6974	1.0671					
	(0.6675)	(0.5920)	(0.6262)	(0.6190)	(0.9343)					
LTO	-96.8474**	-95.4403**	-91.7961**	-92.4879**						
	(0.0379)	(0.0273)	(0.0262)	(0.0260)						
LPR			-4.5877							

			(0.6736)							
LCL	-8.6890	-8.7097								
	(0.4160)	(0.4058)								
LHC	12.2555									
	(0.3682)									
Total Panel Observation	166	166	166	166	166	166	166	136	166	166
Period included	45	45	45	45	45	45	45	45	45	45
Cross-section included	5	5	5	5	5	5	5	5	5	5
Number of instruments	9	8	8	7	6	5	4	4	3	2
Sargan test J-stat	1.8673	1.7397	2.1636	2.1104	2.3719	2.3374	1.9475	0.9933	1.6832	1.8638
	(0.3931)	(0.4190)	(0.3390)	(0.3481)	(0.1235)	(0.1263)	(0.1629)	(0.3189)	(0.1945)	(0.1722)
Arellano-Bond Serial Correlation test (m-stat) order										
AR(1)	-1.2804	-1.3371	-1.3689	-1.3611	-1.6807	-1.6749	-2.7058	-1.2002	-2.7070	-2.5253
	(0.2004)	(0.1812)	(0.1710)	(0.1735)	(0.0928)	(0.0940)	(0.0068)	(0.2301)	(0.0068)	(0.0116)
AR(2)	-0.1120	-0.0297	-0.0757	-0.0783	-0.3805	-0.3713	-1.6666	-1.4732	-1.5897	-1.8559
	(0.9108)	(0.9763)	(0.9396)	(0.9376)	(0.7036)	(0.7104)	(0.0956)	(0.1407)	(0.1119)	(0.0635)

Wald Test Chi-Square	22.8499***	23.7921***	25.3704***	25.1090***	11.9209**	11.6797**	6.9855**	3.2243	7.8055**	7.6745**
	(0.0018)	(0.0006)	(0.0003)	(0.0001)	(0.0359)	(0.0199)	(0.0304)	(0.3583)	(0.0202)	(0.0056)

Source: Own computation using Eviews software 8 (x64). Note: *******, ****** and ***** denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). While D indicates difference and logarithems is denoted as L. The Sargan test of over-identifying restrictions is asymptotically distributed as χ^2 under the null of instruments validity. AR(1) and AR(2) are the Arellano and Bond (1991) tests for first- and second-order serial correlation in the differenced residuals, which are asymptotically distributed as a N(0,1)under the null of no serial correlation

The study based on ten model specification shows the presence of both absolute and conditional β–income convergence in the EAC region from the year 1970 – 2017. The study indicates that the EAC region is experiencing absolute β–income convergence. In other words, irrespective of the difference in the initial income of the EAC member countries, the EAC region is converging at a rate of 33.87%. The result suggests that irrespective of countries structural characteristics such as the difference in population size, human capital and institutional quality, that the EAC region is experiencing beta income convergence.

In terms of conditional β–income convergence, the result from Table 4.4 based on model specifications Two to Nine, the EAC region experienced conditional β–income convergence. However, except for trade liberalization, all control variables are statistically insignificant.

Our empirical results show that the presence of trade liberalization significantly reduces the β–income convergence in the EAC region by roughly 91.80 units to 96.847 units for every increase in trade liberalization during the study period. The plausible explanation of the negative effect on beta income convergence is that the trade openness results into an increase of imported goods to the EAC region. The import of consumer goods also results in capital outflows from the EAC region, hence lowering the capital-labour ratio and hence reducing investment capital in the region. According to Solow's growth model, the developing countries lack the required capital necessary to speed economic growth – thereby, lowering income convergence. Secondly, the advance imported goods could also crowd-out domestic investment, hence slowing the economic growth of the EAC region from the year 1970 – 2017.

We can also see that the recent financial crisis of 2007 reduces β–income convergence in the EAC region. We argue that the financial crisis of 2007 reduces financial investment to the EAC member countries. Reduction of foreign investment capital reduces the economic output of the region. Furthermore, an increase in the interest rate by the US Federal Reserve Bank could have further resulted into foreign capital outflows from the EAC region to the US as they seek a higher rate of return on their investment, thereby, lowering the economic growth of the EAC region during the study period.

Moreover, FDI and domestic investment, although positively supports β–income convergence, it is statistically insignificant. The insignificance of domestic investment and FDI inflows in supporting β–income convergence could be due to inadequate capital injected into production.

Moreover, the availability of human capital and infrastructural development increases the country's absorptive capacity (Borensztein et al. 1998). In other words, human capital and well-developed infrastructure support economic growth labour become more productive. The results

from Table 4.4 suggest that human capital and infrastructure of the EAC region is underdeveloped. Therefore, having an insignificant positive effect on the β–income convergence in the EAC region during the study period.

Furthermore, the study shows that political risk variables did not support the process of β–income convergence in the EAC region from 1970 – 2017 (although statistically insignificant).

4.4 The Role of Bilateral FDI on Income convergence (Beta and Sigma convergence)

Under section 4.4 we looked at the effect of total FDI on beta convergence in the East Africa Community (EAC) region from 1970 –2017. And five countries were involved. Our finding is that FDI insignificantly contributes speed up income convergence. We decided to extend the study by looking at contribution of bilateral FDI from the UK to EAC region. Therefore, in our attempt to provide empirical evidence on income convergence in the EAC region, we focused on four countries (i.e., Uganda, Kenya, Tanzania, and Rwanda). The study period ranges from 2000 – 2017. The selection of these countries and the study period were dedicated by data availability. Our main objective was to examine the role of bilateral FDI on income convergence. We wanted to know whether bilateral FDI converge both the growth rate and income levels. That is, does more bilateral FDI stock from the UK to the EAC region reduce the income per capita gap and growth rate gaps?

Our descriptive statistics for income gap and income level values are reported in Table 4.7 and 4.7a, where Table 4.7a excludes Rwanda from the study.

We started by providing empirical equation, followed by results and then made a brief concluding remark and policy recommendations.

4.5 Empirical equation and results

By following Choi (2004) study, we have used absolute value of growth rate gaps and income level. Choi forwarded an argument that; it is possible for human spillover to occur in both directions. Choi's explanation is based on the idea that, when FDI intensity ratio increases, the income gap between the host and source countries reduces. Based on theoretical discussion (Solow (1956) growth model), we expect signs of our estimated coefficients to be negative. Moreover, Choi further observed, when two countries share similar language and closely located, then economic growth rate and income levels should converge. Therefore, the sign of estimated coefficients for the language and distance variable, according to Choi is supposed to be negative and positive respectively.

Table 4.5 shows variable used to test income and FDI convergence in the EAC region.

Variables	Definition	Measurement	Study year	Source
GDP per capita growth	GDP per capita growth rate	Income convergence in terms of growth rate	2000 – 2017 1970 – 2017	World Bank, WDI database
GDP per capita growth	GDP per capita annual average growth rate	Income convergence in terms of growth rate	2000 – 2017	UNCTAD
GDP per capita	GDP US Dollars at current prices per capita	Income convergence in terms of income level	2000 – 2017	UNCTAD
GDP	GDP US Dollars at current	Growth	2000 – 2017	World Bank, WDI database
Bilateral FDI Stock	Annual FDI stock US $ in current price in	FDI stock convergence	2000 – 2017	UNCTAD Bilateral FDI statistic/Rwanda Foreign Private
Bilateral FDI Flows	Annual FDI stock US $ in current price in	FDI flows convergence	2000 – 2017	UNCTAD Bilateral FDI statistic/Rwanda Foreign Private
Total FDI stock	Annual FDI stock US $ in current price in	FDI convergence	2000 - 2017	UNCTAD
Distance	Distance in	Distance between	2000 – 2017	Distance from to net
Language	Official Language	Language similarity between two countries		CIA Facts book publication

Table 4.6 shows the language similarity between the UK and the EAC region.

Country	Language spoken	Official Language	Decision
KENYA	English (official), Kiswahili (official), numerous indigenous languages	English Kiswahili	Yes
RWANDA	Kinyarwanda (official, universal Bantu vernacular) 93.2%, French (official) <.1, English (official) <.1, Swahili/Kiswahili (official, used in commercial centers) <.1, more than one language, other 6.3%, unspecified 0.3% (2002 est.)	Kinyarwanda French English	No
TANZANIA	Kiswahili or Swahili (official), Kiunguja (name for Swahili in Zanzibar), English (official, primary language of commerce, administration, and higher education), Arabic (widely spoken in Zanzibar), many local languages note: Kiswahili (Swahili) is the mother tongue of the Bantu people living in Zanzibar and nearby coastal Tanzania; although Kiswahili is Bantu in structure and origin, its vocabulary draws on a variety of sources including Arabic and English; it has become the lingua franca of central and eastern Africa; the first language of most people is one of the local languages	Kiswahili or Swahili English	Yes
UGANDA	English (official national language, taught in grade schools, used in courts of law and by most newspapers and some radio broadcasts), Ganda or Luganda (most widely used of the Niger-Congo languages, preferred for native language publications in the capital and may be taught in school), other Niger-Congo languages, Nilo-Saharan languages, Swahili, Arabic	English	Yes

UNITED KINGDOM	English Note: the following are recognized regional languages: Scots (about 30% of the population of Scotland), Scottish Gaelic (about 60,000 in Scotland), Welsh (about 20% of the population of Wales), Irish (about 10% of the population of Northern Ireland), Cornish (some 2,000 to 3,000 people in Cornwall) (2012 est.)	English	Yes

Source: Language information is from Central Intelligence Agency (CIA) world fact book (https://www.cia.gov/library/publications/the-world-factbook/fields/2098.html)

Table 4.7 shows descriptive statistics for the Beta (β) convergence and Sigma (σ) convergence in the EAC region (Uganda, Kenya, Tanzania, Rwanda) for 2000 – 2017.

	Mean	Median	Maximum	Minimum	Obs
GDPg	479.4312	-0.4916	2015.035	-8.1004	71
DISTANCE_KM	7365.763	7210.37	7726.63	6819.47	71
FDIRATIO_STOCK	2.80E-10	2.61E-10	7.47E-10	5.35E-12	71
GDP	2.24E+10	1.67E+10	7.88E+10	1.67E+09	71
GDPgr	0.9705	0.9714	0.9882	0.9269	71
LANGAUAGE	0.760563	1	1	0	71

Source: Own computation using EViews 8 (x64). Where GDPg (GDP per capita gap ratio) while GDPgr (GDP per capita growth difference)

Table 4.7a shows descriptive statistics for the Beta (β) convergence and Sigma (σ) convergence in the EAC region (Uganda, Kenya, Tanzania) for 2000 – 2017.

	Mean	Median	Maximum	Minimum	Obs
GDPg	-1.4771	-1.3923	5.4138	-8.1004	54
DISTANCE_KM	7252.157	7210.37	7726.63	6819.47	54
GDP	2.80E+10	2.36E+10	7.88E+10	5.84E+09	54
GDPgr	0.9682	0.9708	0.98626	0.9269	54
LANGUAGE	1	1	1	1	54

Source: Own computation using EViews 8 (x64). Where GDP g (GDP per capita gap ratio) while GDPgr (GDP per capita growth difference)

Our Table 4.6 captures the language similarity between the UK and the EAC member countries. In order to capture the language similarity between the UK and the EAC member countries, we states that countries that have only English as official language have language similarity with the UK vis-à-vis those that have English and other main international language as their official language.

In terms of calculation of the bilateral distance between the UK and the EAC member we followed Choi (2004) methodology.

According to Choi, the distance between two cities can be calculated using great circle formula, and that each city's longitude and latitude data is present at United Nation's web site http://www.un.org/Depts/unsd/demog/ctry.htm. However, we have sourced our distance information which is also calculated using great circle formula from https://www.distancefromto.net/. Therefore, data on distance used in study is calculated as the distance in kilometer and miles from London city to Kampala city (Uganda), Nairobi city (Kenya), Dar el salaam city (Tanzania) and Kigali city (Rwanda). Our language information from the CIA world facts book (i.e., http://www.odci.gov/cia/publication/factbook) (Choi, 2004)

We applied random effect model (FE-IV) estimation technique by including instrumental variables to control for any potential endogenity in the model. Choi (2004) also adopted Fixed effect model and the pooled OLS and only control for serial correlation. However, our approach allows us to control for serial correlation and endogeneity problem hence offering more reliable estimates.

Therefore, by following Choi (2004) methodology, we computed our FDI ratio($FDIratio_{ijt}$), GDP per capita gap ratio($GDPg_{ijt}$) and GDP per capita growth rate difference ($GDPgr_{ijt}$) as seen in equation (4.8), (4.9) and (4.10) respectively.

$$FDIratio_{ijt} = \left(\frac{FDI_{ijt}}{GDP_{it} + GDP_{jt}}\right) \quad (4.8)$$

In equation (4.8) by linking bilateral FDI to host country's GDP (i.e., FDI ratio), it permeates us to assess the effect of the intensity of FDI ratio on economic performance of the host countries. In theory, Solow argues that countries with low capital stock should experience higher economic growth and vis-à-vis rich countries. In this case our study enables us to capture the effect bilateral FDI from the UK to the rest of EAC member countries. Now looking at equation (4.9)

$$GDPg_{ijt} = \left(\frac{GDPg_{it} - GDPg_{jt}}{GDPg_{it} + GDPg_{jt}}\right) \quad (4.9)$$

The equation (4.9) is GDP per capita gap ratio. It links GDP per capita between the UK and the

EAC member countries. The purpose is to capture convergence of per capita GDP gap between the UK and those of EAC member countries. Where country i denote source country and host country is j while time represented by t as seen in equation (4.8), (4.9) and (4.10) respectively.

$$GDPgr_{ijt} = GDP\_gr_{it} - GDP\_gr_{jt} \quad (4.10)$$

Our equation (4.10) computation is the measurement of GDP per capita growth rate difference between the UK and those of the EAC member countries.

Finally, to empirically capture the effect of FDI ratio, language and distance in kilometer (KM) on income gap (i.e., per capita GDP gap between the UK and EAC member countries and income levels (i.e., growth rate GDP per capita difference) between the UK and EAC member countries, specification model (4.11) and (4.12) are estimated respectively.

Equation (4.11) and (4.12) are adopted from Choi's study.

$$logGDPg_{ijt} = \propto_1 + \propto_2 * \log(FDIratio_{ijt}) + \beta_3 * log(Dist)_{ijt} + \beta_4 * language_{ijt} + \omega_{ijt} \quad (4.11)$$

$$logGDPgr_{ijt} = \beta_1 + \beta_2 * \log(FDIratio_{ijt}) + \beta_3 * log(Dist)_{ijt} + \beta_4 * language_{ijt} + \mu_{ijt} \quad (4.12)$$

Where FDI_{ijt} represent the bilateral FDI from source country i to host country j in time t. While $GDPg_{ijt}$ and $GDPgr_{jt}$ stands for per capita domestic product (GDP) for source country i and the host country j in time t. While the $GDPgr_{ijt}$ reflects the per capita gross domestic product (GDP) growth rate for the source country i and the host country j in time t

An extra variable added to the model specification is language and distance. For instance, $Dist_{ijt}$ represent distance in kilometres from country i to country j. While $language_{ijt}$ measure similarity in language between source country i to those of the host country j, whereas Dummy 1 suggest language similarity and 0 otherwise.

Table 4.8 and 4.9 reports empirical output on GDP per capita gap and the GDP per capita growth rate difference between the UK and the EAC region.

We have used few variables when examining the role of bilateral FDI on income gap and income levels by following Choi's study.

4.5.1 The role of bilateral FDI on Income convergence (Beta and Sigma convergence) – Empirical results

We presented our empirical results as seen in Table 4.8 and Table 4.9 below consists of our sigma and beta convergence. Table 4.10 is the summary of basic characteristics of panel unit root test use in capture stochastic convergence in the region. In addition, Table 4.11 consists of our stochastic evidence of income convergence while 4.12 and Table 4.12a shows stochastic bilateral FDI. Our study period ranges from 2000 to 2017, as it was the years bilateral FDI statisctic data were available at UNCTAD website. Similarly, Donou-Adonsou and Lim (2018) studied the importance of Chinese FDI to 36 African countries from 2003-2012 and used fixed effect model estimation technique. They concluded that that African economies benefited from Chinese bilateral FDI. Donou-Adonsou and Lim (2018) also sourced their Chinese bilateral FDI data from bilateral FDI statistics present at UNCTAD database.

Sigma convergence

Bilateral FDI and GDP per capita income convergence

Table 4.8 presents the from Random Effect model (RE-IV) regression results. Which regress the per capita GDP gap ratio (GDP_g) on the FDI intensity ratio (FDI-ratio). Model 1 – 4 contain FDI intensity ratio as our explanatory variable.

The result from model A indicate presence of significant absolute income level convergence between the UK and the EAC region. Moreover, according to our model 1 and 3 the coefficients of the FDI-ratio is -0.2136 and highly significant.

This implies that a unit increase in the FDI intensity ratio result to a GDP per capita gap ratio by 0.214 units in the short run. Indicating that GDP per capita converge due to an increase in bilateral FDI between source (UK) and host region (EAC) in short run. When we account for common language and distance variable seen in model 3 and 4 respectively. The short-run coefficient for the FDI intensity ratio reported in model 3 and 4 is –0.2413 and –0.0837 respectively. The signs of the coefficients remain the same as that of model 1, with only model 3 being highly significant. Confirming that FDI intensity ratio reduces income gap between source UK country and the host EAC region.

In model 2, 5 and 6, we included one period lagged dependent variable (GDP per capita) to remove any potential serial correlation in the estimated model, by following Choi (2004) study. The result

from model 2 that contain FDI intensity ratio variable as explanatory variable – our empirical evidence shows that a unit increase in the FDI intensity ratio reduces the GDP per capita gap ratio between the source and the host country by 1.423 units in the long-run.

In model 3, 6 and 7 account for common language dummy variable (language). The result suggests that the improvement in the common language between source country and the EAC region significantly contributed to narrowing the income gap from 2000 – 2017.

In model 3, an improvement in the language results into a significant short-run decrease of 6.2057units of GDP per capita between source and host region. In other words, in the short-run period, GDP per capita tend to converge when the UK and the EAC region use the same language. However, as seen in model 6, in the long run, using same language between the UK and the EAC region significantly help to reduce income levels by 6.9115 units for an improvement in the language similarity (in our study, English).

Unsurprisingly, language seems to have greater effect than FDI intensity ratio variable when it comes to speeding up reduction in the income gap between the UK and the EAC region. For instance, in the short run, a unit increase in language similarity and FDI ratio intensity from year 2000 – 2017 have significantly contributed to the GDP per capita gap convergence between the UK and EAC member countries by 6.21 units and 0.24 units respectively. We argue that the EAC region have greater language similarity with the UK hence speeding up technology spillover from the foreign investors with the local producers. When it comes to the bilateral FDI to the EAC region, it is very low, hence language similarity playing greater role in the income gap convergence between the UK and the EAC region during the study period.

In model 6, we accounted for the bilateral distance (distance) as independent variable, and the estimate indicate that a unit improvement in the language between the UK and the EAC region reduces income gap by 4.1775 units in the short-run period.

Turning the bilateral distance (distance) between the UK and the EAC region, according to Choi (2004) distance plays an instrumental role in explaining both income level and growth rate convergence. This might be the case that the closer the two countries the greater the language similarity and the higher the chance of increase trade and investment between the countries, hence contributing to the process of "catch-process" in terms of income gap and income levels, whereby the poorer economies catching up with rich economies both income level and growth rate gap.

The coefficient for the distance variable is positive and statistically significant. According to Choi (2004), The GDP per capita gap ratio tends to converge when the UK and the EAC region are closely located. For example, in the short-run and long-run period, our study suggests that when

the UK and the EAC region distance narrow by a unit in the short-run and long-run, the in the income gap between the UK and the EAC region significantly reduces by 69.9132 units and 62.2607 units respectively. However, when we account for language variable as independent variable seen in model 7, the short-run performance of the distance variable is reduced based on size of estimated coefficients 31.5567.

Considering our finding in the Table 4.8, when we consider Mayer-Foulkes and Peter Nunnenkamp (2009) study, where they assessed the contribution of FDI on convergence, by using data from US Department of Commerce, Bureau of Economic Analysis (BEA) which entailed information for US FDI abroad, they observed that contribution of FDI to convergence is debatable. By citing Findlay (1978) study, they argued that developing countries with huge technology gap visa-visa-vis country of FDI origin that these developing countries are unable to benefit from FDI hence that they would struggle to catch-up with developed economies.

In addition, Alfaro et al. (2004); Hermes and Lensink (2003); Borensztein et al. (1998); De Mello, (1997) all argues that developing countries should attained minimum level of economic development in order to capture the growth-enhancing effects of FDI.
Our empirical findings mirror those of Choi's (2004) results. We conclude that the FDI intensity ratio, common language and the bilateral distance contributed to the narrowing the income gap (GDP per capita gap ratio) between the UK and the EAC region.

Sigma Convergence

Table 4.8 shows GDP per capita ratio between the UK and the EAC member countries (i.e., Uganda, Kenya, and Tanzania) from 2000 – 2017.

Regressors	Model A	Model 1	Model 2	Model 3	Model 4	M odel 5	Model 6	Model 7
Constant	4.5344***	-2.0139	-1.3061***	1.5314	-620.5308***	-168.7457***	5.1481***	-274.9522***
	(0.0000)	(0.2086)	(0.0000)	(0.3407)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LOG_GDPg (-1)	-0.5910***		0.9544***			0.6931***	0.3231***	
	(0.0000)		(0.0000)			(0.0000)	(0.0000)	
LOG_FDIRATIO_ STOCK		-0.2136***	-0.0649***	-0.2413***	-0.0837			
		(0.0049)	(0.0000)	(0.0012)	(0.4912)			
LANGAUAGE				-6.2057***			-4.6784***	-4.1775***
				(0.0000)			(0.0000)	(0.0000)
LOG_DISTANCE _KM					69.9132***	19.1078***		31.5567***
					(0.0000)	(0.0000)		(0.0000)
Sargan test (Prob J-statistic)	0.7426	0.1070	0.1543	0.2604	0.9486	0.8343	0.8888	0.7261
F-Statistics	662.5606***	1.7067***	565.6531	754.0855	114.2818***	623.0562***	754.2752***	246.3320***

	(0.0000)	(0.2099)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Instruments	4	4	4	4	4	4	4	4
Periods included	15	15	15	16	16	16	16	17
Cross-sections included	3	3	3	3	3	3	3	3
No. of Obs.	18	18	18	20	22	20	20	24
R-squared	0.9764	0.0171	0.9870	0.9883	0.9239	0.9865	0.9889	0.9892

Source: Own computation using Eviews software 8 (x64). Note: *******, ****** and ***** denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). LOG denotes logarithms. All models are estimated using Fixed effect method. Besides, our Sargan test (Prob J-statistic) indicates that correct instrument variables were used in the study.

Beta convergence

Bilateral FDI and GDP per capita growth rate convergence

Table 4.9 shows panel regression, where we regressed GDP per capita growth rate difference ($DGDP_{gr}$) between the source (i.e., the UK) and the host region (the EAC) on the FDI intensity ratio. By following Choi's (2004) analysis.

The result from model 1 the results suggests that GDP per capita growth rate difference between the UK and the EAC region in the short-run decrease by 0.0035. However, the short-run effect of the FDI intensity ratio on the income level (GDP per capita growth rate difference) is insignificant. However, when we included language variable as seen in Table 4.9, model 4, it turns out that the coefficients of the GDP per capita growth rate difference is 0.0731, suggesting that income levels between the UK and the EAC region significantly decrease when equation includes common language dummy variable as independent variable.

However, in the long-run, when language variable is included in the model, it turns out that the FDI intensity ratio led to income level convergence between the UK and the EAC region. In other words, a unit increase in the FDI intensity ratio results to insignificant decrease of GDP per capita growth rate difference between the UK and the EAC region by 0.0121 units in the long run. This could be that language similarity as argued by Choi (2004) results into technological diffusion from the UK firms to the domestic investors in the EAC region.

According to Xu (2000) and Görg and Greenaway (2004), we argued that the EAC region does not possessed enough absorptive capacity (human capital proxy by English language) to significantly benefit from bilateral FDI from the UK to the EAC region in the long run. Plausible explanation to this could be due to under investment in education and training workforce in the EAC region by respective member state, hence producing poorly equipped labor-force (poorly educated). Therefore, the during the study period, it seems the language similarities was not enough to help the EAC citizenry benefit from the advance foreign technology required to significantly narrow the GDP per capita growth rate difference between the UK and the EAC region.

However, when we include distance variable in the model as seen in model 5, it turns out that there is insignificant negative effect of the FDI intensity ratio in narrowing the growth rate difference between the UK and the EAC region. For example, a unit increase in the FDI intensity ratio resulted into insignificantly expansion of the GDP per capita growth rate difference between

the UK and the EAC region by 0.0029 units in the long run. Although distance results into widen GDP per capita gap ratio (beta-divergence) in the short-run by 0.0192 units for every additional increase in the distance, in the long-run however, distance contributes to narrowing GDP per capita gap ratio by 0.1835 units. The figure is seen in model 5 and it shows that distance variable is insignificant.

We conclude that FDI intensity ratio significantly reduces income levels between the UK and the EAC region in the short run. However, when language variable and bilateral distance accounted for in the model, we found that the effect of FDI intensity ratio on GDP per capita growth rate difference between the UK and the EAC region is negative and positive respectively. Indicating that the FDI intensity ratio led GDP per capita growth rate convergence in the long-run when language is accounted for in the model 3 vis-à-vis distance variable.

Table 4.9 shows GDP per capita growth rate convergence between the UK and the EAC member countries (i.e., Uganda, Kenya, Tanzania, and Rwanda) from 2000 – 2017.

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-0.1094*	0.1983**	0.0204	8.8016***	0.1675
	(0.0652)	(0.0277)	(0.5366)	(0.0006)	(0.4618)
LOG_GDPgr(-1)			1.0661***		1.1046***
			(0.0000)		(0.0000)
LOG_FDIRATIO_STOCK	-0.0035	0.0088**	0.0008	-0.0731***	-0.0003
	(0.1800)	(0.0145)	(0.5536)	(0.0001)	(0.7611)
LANGAUAGE		-0.0316**	-0.0010	-1.1778***	
		(0.0164)	(0.8218)	(0.0003)	
LOG_DISTANCE_KM					-0.0192
					(0.4759)
Sargan test (Prob J-statistic)	(0.7942)	(0.5721)	(0.5923)	(0.2193)	(0.2650)
F-Statistics	1.8400	3.9069**	102.0293***	57.4781***	94.9427***
	(0.1796)	(0.0328)	(0.0000)	(0.0000)	(0.0000)
No. instruments	3	4	5	4	6
Periods included	17	17	17	17	17
Cross-sections included	4	4	4	4	4
No. of Observations	68	29	29	68	29
R-squared	0.0338	0.1469	0.9169	-11.5760	0.9192

Source: Own computation using Eviews software 8 (x64). Note: *******, ****** and ***** denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). LOG denotes logarithms. All models are estimated using Fixed effect method. Besides, our Sargan test (Prob J-statistic) indicates that correct instrument variables were used in the study.

4.6 Stochastic Income and FDI Convergence: A panel Unit root Approach

The study period involve for the income convergence is from 1970 –2017 and five EAC countries (i.e., Uganda, Kenya, Tanzania, Rwanda, and Burundi) were included in the study. For the stochastic FDI convergence, we used two measurement of FDI (i.e FDI Stock and FDI flows) as this would provide us more robust empirical results. Burundi has been excluded from the study due to luck of secondary data.

Under this section, the concept stochastic convergence refers to cointegration among time series (Bernard and Durlauf, 1996, 1995). According to Genc et al. (2019), Campbell and Mankiw (1989) applied first the stochastic convergence technique in their study. When variables are stationary, it has assumed there is a presence of convergence. For, Carlino and Mills (1996) and Loewy and Papell (1996) noted that stochastic convergence in cross- sections of the region if regions deviation of per capita income compared to another country consist of the non-zero mean stationary stochastic process.

4.7 Empirical equation and results

In order to capture foreign direct investment (FDI) and income stochastic convergence in the EAC region, we need to carryout panel unit root. Our empirical results seen in Table 4.12 and Table 4.12a reflect evidence of income and FDI stochastic convergence since the panel unit root test is stationary (i.e., presence of cointgration). We will return to the discussion of our empirical results later. For now, we start by briefly explaining how panel unit root is carried out in this empirical section.

To test for panel unit root, we utilised three-panel unit root test techniques. Namely, Levin- Lin-Chu (LLC), Im, Pesaran and Shin (IPS), and Fisher-type panel unit root tests. Moreover, Kunest and Zimmermann (2011) recommended that it is useful to use the three-panel unit root test. Kunest suggests that there is no dominant performance of any one panel unit root test techniques. To obtain robustness test, LLC, IPS and Fisher-type panel unit root tests test techniques are applied (Slimane *et al*., 2016).

Also, recent literatures suggest that panel-based unit root tests have higher power than unit root tests based on individual time series (Im et al, 2003; Levin et al, 2002; Breitung, 2002; Choi, 2001; Maddala and Shaowen, 1999).

Furthermore, Hoang and McNown posit that the general structure used by most unit root test techniques that determine the presence of stationarity in panel data can be written as seen in

equation (4.13)

$$\Delta Y_{it}=\rho_i Y_{it-1}+\sum_{i=1}^{\rho i} \emptyset_{i,l}\Delta Y_{it-1}+\beta_i K_{it}+\mu_{it} \quad (4.13)$$

Where K_{it} denotes deterministic components, with p = 0 implying existence of unit root for an individual (i) in the Y process, while p < 0 suggests, around the deterministic part, the process is stationary.

Levin-Lin-Chu (LLC) test, in the context of the null hypothesis, suggests that individual time series has no unit root, and that alternative hypothesis has unit root (Asteriou and Hall, 2011). However, According to Asteriou and Hall (2011), the disadvantage of using LLC test is based on its restrictiveness. In other words, it does not permit the intermediate case where some individuals are not subject to unit root while others. Conversely IPS and Fisher-type panel unit test relax Levin-Lin-Chu restriction, by allowing for heterogeneous coefficients. However, Kunest and Zimmermann (2011) observed that under Monto Carlo simulations, Im-Pesaran-Shin test techniques perform better for small samples compared to Levin-Lin- Chu test technique. Kunest and Zimmermann (2011) observed, under Monto Carlo simulations, I m -Pesaran-Shin test techniques perform better for small samples compared to Levin-Lin-Chu test of Fisher-type test technique is suitable for conducting panel unit root test where for both balance and unbalance data set.

Table 4.10 shows summary of basic characteristics of panel unit root test available on the EViews software.

Test technique	Null hypothesis	Alternative hypothesis	Possible deterministic component	Assumed unit root process	Autocorrelation correction method	Method (stat and P-Value)
Levin, Lin and Chu (LLC)	Unit root	No unit root	None, F, T	Common unit root process	Lags	Levin, Lin & Chu t*
Breitung	Unit root	No unit root	None, F, T	Common unit root process	Lags	Breitung t-stat
Im, Pesaran, And Shin (IPS)	Unit root	Some cross- sections without UR	F, T	Individual process	Lags	Im, Pesaran and Shin W-stat
Fisher ADF	Unit root	Some cross- sections without UR	None, F, T	Individual process	Lags	ADF - Fisher Chi-square
Fisher – PP	Unit root	Some cross- sections without UR	None, F, T	Individual process	Kernel	PP - Fisher Chi- square

Source: Eviews website. Note: The LLC, IPS, Breitung, and Hadri's probability values are computed assuming asymptotic normality while for ADF - Fisher Chi-square and PP - Fisher Chi-square; their probability values are computed using asymptotic Chi-square distribution. All other tests assume asymptotic normality.

From the Table 4.10 above, the none – represent no exogenous variables while F and T denote fixed effect, and individual effect and individual trend respectively.

The Eviews 8 (x64) software are used in the study. The advantage of using Eviews 8 software is that it provides us the opportunity to test panel unit root test at level, first or second difference. In this study majority of our variables were tested at levels were found to be stationary. However, variables such as technology gap, population age 15-64 (% of total population) (Popb), infrastructure and GDP per capita were not stationary at levels except in first difference. The deterministic component selected is individual intercept and individual intercept and trend.

When it comes to lag selection, again Eviews 8 Software provides us two different options to select lags when testing panel unit root. That is, we can either use automatic lag selection or impose lag. In this thesis we use automatic lag selection with the aid of Akaike Info Criterion (AIC) or Schwarz Info Criterion (SIC). However, when our variables were not stationary at levels, we corroborate by imposing lag 1.

We also note that when we imposed lag 1, IPS, and Fisher -PP does not allow us to select bandwidth and spectral estimation (Kernel). While Fisher PP permits spectral estimation (Kernel) and bandwidth selection either through automatic or user specification bandwidth

While testing for panel unit root test using LLC technique allow as to impose lag 1, in addition to granting us option to select bandwidth either automatically or using user specification bandwidth, and the Bartlett kernel.

In attempting to capture stochastic FDI and income growth rate convergence, we followed Lei and Tam (2010) methodology. The variables in this study consist of bilateral FDI, total FDI and Income convergence. We applied LLC, IPS, ADF-Fisher and PP-Fisher panel unit root.

We first show how we computed our data used in the study as seen in equation (4.14) below. After which empirical findings reported in Table 4.11, 4.12 and Table 4.12a, are discussed.

$$\frac{GDPpercapita_{it}}{\sum_{i=1}^{N} GDPpercapita_{it}/N} \quad \text{For all the EAC member countries} \qquad (4.14)$$

Where $GDPpercapita_{it}$ represents the annual average per capita GDP growth rate for i in time t.While N denotes the number of countries (i.e., Five EAC member countries). For FDI convergence, we followed the same computation seen above in the equation.

From equation (4.14) above, we divided our time series data with cross-sectional mean which are in logarithm. As expected, the result shows the presence of income growth rate convergence.

The convergence in the economic growth might be due to homogeneity among member countries as they belong to the same trading block, with similar cultural, economic, and political settings. Furthermore, result from Table 4.9 confirms the presence of FDI convergence among the EAC region. Our datasets during the study period are stationary at levels. We accept our null hypothesis of presence of FDI and income convergence at 5% level of significance.

In this study, we conducted panel unit tests on the EAC regional income and FDI variables using LLC, IPS and ADF tests. According to Newey and West (1994), selection of lag length is an essential part of unit root testing. For instance, Hammond (2006) conducted a unit root test by imposing a lag structure instead of testing for an optimal lag length. We followed Hammond by imposing a lag length of 1 (one) in our estimation. The spectral estimation of the kernel: Bartlett and bandwidth selection of Newey-West automatically selected. Under the LLC and IPS panel unit root test, the probabilities are computed assuming asymptotic normality. While probabilities for Fisher (ADF and PP) panel unit root test are computed using an asymptotic Chi–square distribution. All other tests assume asymptotic normality.

Genc et al. (2009) remarked that Hammond could have imposed the lag length due to the short span of his data. They further noted, from their test; there was not any significant variance concerning utilising imposed lag length or automatic lag selection.

However, lag selection can be optimally selected with the help of Schwarz Information Criterion (SIC), Akaike Information Criterion (AIC). These are two widely used selection method. Other techniques are Hannan-Quinn Criterion, t – statistics and modified version of SIC and AIC. However, it seems AIC yield better results that SIC for study with a small sample size (Ender, 2004).

In our study, we provided the panel unit root test with three lag selections. That is imposing lag 1(Hammond, 2006), then allowing lag selection to be optimally selected with the help of AIC and SIC.

Finally, our empirical estimates include constant and the time trend as this would provide a better description of stochastic convergence the EAC region (Alvi and Rahman, 2005)

4.7.1 Stochastic Income Convergence – Empirical results.

We provided our empirical results on stochastic income convergence in the EAC region and we conclude that there is presence of income convergence as reflected in Table 4.11. For instance, we conducted stochastic income convergence for the EAC region from 1970 –2017. The panel unit root test enabled us to capture the stochastic income convergence. We also adopted three estimation techniques, and these are LC, IPS and ADF. Moreover, ADF-Fisher and PP-Fisher panel unit test were to confirm our findings. The test involves individual intercept (a) and intercepts with a trend (b) — the result from Table 4.11 report stochastic income convergence for the five EAC member countries, and our variable, log GDP per capita growth rate (annual %) span from year 1970 – 2017.

We start by presenting a report from Table 4.11 based on imposed lag selection, SIC and AIC optional lag selection as seen in Panel A and B, for the study periods 1970 – 2017.

The evidence from both Panel A and B based on the LLC, IPS and ADF-Fisher and PP-Fisher estimation techniques indicate the presence of growth rate income convergence for the study periods.

Considering the performance of the different estimation techniques in this study, Table 4.11 seems to suggest that IPS and ADF performed better than LLC techniques.

Our conclusion, from empirical output shows that during the study periods, the EAC member countries witnessed growth rate income convergence for the period under studies (i.e., income convergence). Implying, poorer EAC member countries like Burundi is catching up with a more prosperous country like Kenya.

Table 4.11 shows Five EAC Stochastic Income Convergences (Log GDP per capita Growth Rate) (1970 – 2017).

PANEL A								
Imposed lag	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
LOG_GDPPERCAPITAGROWTHRA	-1.5962	-0.711	-2.5811***	-2.0330**	9.79689***	7.15297**	9.79689***	7.15297**
	-0.0552	-0.2386	-0.0049	-0.021	-0.0075	-0.028	-0.0075	-0.028
Lag imposed	1	1	1	1	1	1	1	1
SIC	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP- F (a)	PP-F (b)
LOG_GDPPERCAPITA GROWTHRA	-1.5962*	-	-	-2.0330**	9.79689***	7.15297**	9.79689***	7.15297**
	(0.0552)	(0.2386)	(0.0049)	(0.0210)	(0.0075)	(0.0280)	(0.0075)	(0.0280)
Automatic lag length selection based on	0	0	0	0	0	0	N/A	N/A
PANEL B								
AIC	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
LOG_GDPPERCAPITA GROWTHRA	-1.5962*	-0.7110	-2.5811***	-2.0330**	9.79689***	7.15297**	9.79689***	7.15297**
	(0.0552)	(0.2386)	(0.0049)	(0.0210)	(0.0075)	(0.0280)	(0.0075)	(0.0280)
Automatic lag length selection based on	0	0	0	0	0	0	N/A	N/A

Source: Own computation using Eviews software 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). LOG denotes logarithms Panel unit root are tested using Levin, Lin and Chu (LLC), Im, Pesaran, and Shin (IPS), Fisher ADF Fisher.

Turning to FDI convergence reported in Table 4.12 and Table 4.12a, we wanted to understand whether, over time, the rest of the EAC region were converging in terms of receiving bilateral FDI from the UK. The UK is one of the leading foreign investors in the region. The study ranges from 2000 – 2017. The stochastic panel unit root approach is applied to test for FDI convergence. We divide FDI into flows and Stock. We divided FDI into FDI stock and FDI flows with a view of obtaining robust empirical results.

In Table 4.12 and Table 4.12a shows that, during the study period, the EAC region has witnessed the process of bilateral FDI convergence. Just like reports from Table 4.11, ADF and IPS have performed well than LLC estimation techniques. In this case, we conclude that Fisher PP and IPS perform better than LLC in a study involving shorter periods. Moreover, our results from Table 4.12a suggest, when lags are optionally selected by the help of SIC and AIC, the performance of the estimation techniques involved in these study produces better results.

Our observation pertaining performance of Fisher ADF and Fisher PP (Philip Perrone) seen in Table 4.12 and Table 4.12a, we note that, unlike results in Table 4.11, the result in Table 4.12 shows that Fisher PP performed much better than Fisher ADF. Our conclusion based the empirical evidence; we report that the EAC region witnessed bilateral FDI convergence, although it is much pronounced in the bilateral FDI flows compared to FDI stock. Also, when exclude Rwanda, smallest economy and only consider only three large economies in the EAC region, i.e. Uganda, Kenya and Tanzania, the performance of the bilateral FDI stock improves both in the IPS and Fisher ADF estimation technique.

However, it is worth noting, in Table 4.12 and Table 4.12a, based on the significance level, the empirical results have generally shown mixed statistical significance. For instance, in Table, 4.12 pertaining FDI stock, only result from LLC (estimation with individual intercept) suggests the presence of stationarity at levels in the panel dataset, indicating, during the study of period 2000 – 2017, FDI stock convergence within the four EAC countries. However, for the case of FDI flows, only result from LLC (estimation with individual intercept and individual trend) indicates the presence of FDI convergence.

4.7.2 Stochastic Bilateral FDI convergence – Empirical results

In this section we present our empirical output on stochastic bilateral FDI convergence in the EAC region. The bilateral FDI stock and flows are from the UK to the EAC region. As noted above, Burundi is excluded from the analysis due to lack of secondary data. See our empirical results in Table 4.12 and Table 4.12a.

Table 4.12 Shows bilateral FDI Stock convergence in the EAC – Stochastic Panel Unit Root Approach from 2000 – 2017.

PANEL A								
Imposed lag	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
FDI_STOCK (4 countries)	-3.1859***	-0.1177	-0.9933	1.04591	13.0998	2.86072	7.58546	5.35060
	(0.0007)	(0.4531)	(0.1603)	(0.8522)	(0.1085)	(0.9428)	(0.4750)	(0.7195)
Lag imposed	1	1	1	1	1	1		1
FDI_STOCK (3 countries)	-3.3514***	-0.4260	-1.5937*	1.18212	12.2858*	1.54606	6.72464	1.86011
	(0.0004)	(0.3351)	(0.0555)	(0.8814)	(0.0559)	(0.9564)	(0.3471)	(0.9321)
Lag imposed	1	1	1	1	1	1		1
SIC	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
FDI_STOCK (4 countries)	-1.7411**	0.14376	-0.3086	0.82883	7.91828	5.43811	7.58546	5.35060
	(0.0408)	(0.5572)	(0.3788)	(0.7964)	(0.4415)	(0.7099)	(0.4750)	(0.7195)
Automatic lag length selection based on SIC	0	0	0	0	0	0	N/A	N/A
PANEL B								
AIC	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
FDI_STOCK (4 countries)	-1.7262**	0.14376	-0.1916	0.82883	7.76889	5.43811	7.58546	5.35060

	(0.0422)	(0.5572)	(0.4240)	(0.7964)	(0.4564)	(0.7099)	(0.4750)	(0.7195)
Automatic lag length selection based on AIC	0 to 1	0	0 to 1	0	0 to 1	0	N/A	N/A

Source: Own computation using Eviews software 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). LOG denotes logarithms Panel unit root are tested using Levin, Lin and Chu (LLC), Im, Pesaran, and Shin (IPS), Fisher ADF Fisher.

Table 4.12a shows bilateral FDI Flows convergence in the EAC – Stochastic Panel Unit Root Approach from 2000 – 2017.

PANEL A								
Imposed lag	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
LN_B_4FDI_FLOWS	-1.0997	-1.9326**	0.6725	-0.0588	3.4933	6.6837	7.5293	14.5749*
	(0.1357)	(0.0266)	(0.7494)	(0.4766)	(0.8997)	(0.5711)	(0.4807)	(0.0680)
Lag imposed	1	1	1	1	1	1	1	1
	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PPF (b)
LN_B_4FDI_FLOWS	-1.8427**	-3.9695***	-0.2886	-1.7463**	8.17126	14.7694*	7.52936	14.5749*
	(0.0327)	(0.0000)	(0.3864)	(0.0404)	(0.4169)	(0.0638)	(0.4807)	(0.0680)
Automatic lag length selection based on SIC	0	0	0	0	0	0	N/A	N/A
PANEL B								
AIC	LLC (a)	LLC (b)	IPS (a)	IPS (b)	ADF-F (a)	ADF-F (b)	PP-F (a)	PP-F (b)
LN_B_4FDI_FLOWS	-1.8747**	-3.5429***	-0.3329	-1.7616**	8.25662	15.0218*	7.52936	14.5749*
	(0.0304)	(0.0002)	(0.3696)	(0.0391)	(0.4088)	(0.0587)	(0.4807)	(0.0680)
Automatic lag length selection based on AIC	0 to 1	0 to 3	0 to 1	0 to 3	0 to 1	0 to 3	N/A	N/A

Source: Own computation using Eviews software 8 (x64). Note: ***, ** and * denotes significance at the 1%, 5%, and 10% level respectively. Parenthesis contains probability value (p-values). LOG denotes logarithms Panel unit root are tested using Levin, Lin and Chu (LLC), Im, Pesaran, and Shin (IPS), Fisher ADF Fisher.

4.8 Conclusion and Policy Recommendations

We presented our conclusion and policy recommendations based on our research question – did the EAC region experience income and FDI convergence during the study period? We started with the conclusion then followed by policy recommendations.

4.8.1 Conclusion

Solow (1956) posits that countries with low capital stock should grow much faster than those with significant capital stock due to diminishing return to capital stock. Therefore, we expect that developed countries with high capital-labour ratio witnessed lower economic growth than developing countries with low capital-labour ratio. According to Solow (1956), developing countries, in the long run, will converge to steady-state growth, or catch up with the developed economies.

In our study, we investigated the possibility of income and FDI convergence in the EAC region. Firstly, our study consisting of study period 1970 – 2017, and entailing five EAC member states (i.e. Uganda, Kenya, Tanzania, Rwanda and Burundi) suggest that the EAC member countries have registered both the absolute and conditional beta income convergence. We adopted 1970 – 2017 study period because this would give us a better understanding of the income convergence process in the region than shorter study period. We used this longer period because of data avaialablity. However, In the context of control variables, all explanatory variables had zero effect on the dependent variable, except trade liberalization. For example, the recent financial crisis had zero effect on income convergence process of the EAC member countries. Conversely, trade liberalisation had significant effect on the income convergence process in the EAC region. In other words, trade liberalization enhanced income convergence among the EAC regional member countries during the study period.

Furthermore, given the historical ties between the UK and the majority of the EAC member countries (i.e., Uganda, Kenya and Tanzania and Rwanda), we investigated the income and FDI convergency from 2000 – 2017. This shorter period was considered due to data constraint.

Therefore, given data availability, we explored the possibility of income convergence between the UK and the EAC region composed of four countries (i.e., Uganda, Kenya, Tanzania, and Rwanda). We excluded Burundi due to luck of bilateral data between Burundi and the UK. We also examined whether, in the long run, the EAC member countries will converge in terms of receiving bilateral FDI from the UK to the respective EAC member states. Our study period ranges from 2000 –2017. In this study, we closely followed the working of Choi (2004) and therefore,

deployed fixed effect model (FEM) estimation technique. Also, the interpretation of our empirical results is based of Choi's interpretation.

Our study shows that the EAC member countries have benefited from bilateral FDI both in the short-run and long-run period. The result makes sense because in the long run all factors of production are adjustable and therefore, they are fully employed in the production of country's output (i.e., goods and service) hence raising productivity of invested capital. Hence, effect of FDI intensity ratio on income growth rate is higher in the long-run vis-à-vis short-run period. Therefore, a unit increase in FDI ratio intensity significantly reduces income per capita growth rate gap between EAC member countries and the UK.

We accounted for the role of language and distance (i.e., between the UK and the EAC region measured in Kilometres) on beta income convergence. During the study period, language variable significantly contributed positively to the process of income level and growth rate convergence. Indicating, language similarity between the source and host countries ease communication between foreign and domestic labour hence acting as a medium of productivity spillover. Furthermore, we also found that language similarity played a critical role in speeding up income convergence than the FDI intensity ratio.

We also explored whether the bilateral FDI intensity ratio results into reduction of income disparity (sigma income convergence) between the UK and the EAC region from 2000 – 2017. In the study, we accounted for the role of distance and language, as reflected in the Choi's (2004) study.

We found that the bilateral FDI intensity ratio significantly contributed to narrowing the income level gap between the EAC member country citizenry and the UK nationals. Moreover, the effectiveness of bilateral FDI intensity ratio on reducing income disparity between the UK and the EAC region both in short-run and long-run is further supported by the presence of language similarity. Conversely, distance variable had zero effect on reducing income disparity between the UK and the EAC region in the long-run period.

We further corroborate our earlier findings on the beta income convergence consisting of five EAC member states and studying spanning from 1970 –2017. We looked at longer period of ranging from 1970 – 2017 because of data available, and so this would give as better empirical results. Furthermore, we also examined whether EAC member countries converge in terms of receiving the UK bilateral FDI from 2000 –2017.

In the thesis, we achieve this (i.e., FDI and income convergence) by following Lei and Tam (2010) methodology to capture stochastic FDI and income convergence (beta income convergence) by

applying a three-panel unit root test consisting of LLC, IPS and ADF technique.

According to Newey and West (1994), selection of lag length is a vital part of unit root testing. The lag length can either be imposed or as noted, Ender (2004), lag length can be optimally selected with the help of Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC). For instance, in Hammond (2006) study, Hammond conducted a unit root test by imposing a lag structure instead of testing for an optimal lag length. However, Genc et al. (2009) said that Hammond could have imposed lag length due to the short span of his data.
Moreover, in terms of estimation, Alvi and Rahman (2015) reported that empirical estimates that include constant and the time trend provide a better description of stochastic convergence.

Therefore, in our study, we adopted three-panel unit root test, selected three lag speciation and estimated our empirical model by including constant and the time trend in an attempt to give us a better description of stochastic convergence.

Our empirical results show that from 1970–2017, the EAC region witnessed beta income convergence. Moreover, it also shows that in the year 2000 – 2017, the EAC member states are converging concerning receiving bilateral FDI from the UK.

Moreover, we oberseverd that following Hammond's method of imposing lag length of 1 (one) in our estimation, the significance of our estimation reduces compared to allowing the lag length specification to be optimally selected with the aid of SIC or AIC criteria.

Furthermore, evidence of stochastic income convergence was more significant when we use IPS and ADF vis-à-vis LLC. We observe that IPS and ADF provide statistically significant results when testing for panel unit root test, which involves an extended study period.

Alvi and Rahman (2015) suggest that empirical estimates that include constant and the time trend provide a better description of stochastic convergence, we found that when the extended study period is applied it seems that estimation involving only constant also yield valid results. However, when the short study period is involved, then estimation involving constant and the time trend provided better description of stochastic convergence. Our empirical results show presence of bilateral FDI convergence in the EAC region.

For instance, we test the bilateral FDI convergence, which involves a short study period (2000 –2017), and the results from on LLC vis-à-vis IPS and ADF technique shows that the EAC member

states registered bilateral FDI convergence.

4.8.2 Policy recommendations

Our study indicates that the EAC member countries experienced income convergence from 1970 – 2017. In other words, Uganda, Kenya, Tanzania, Rwanda and Burundi have moved towards the steady-state growth. Given that trade liberalisation significantly hurts the income convergence process during the study period, we recommend that the EAC member countries initiate tariffs on imported consumer goods that are readily produced by the member countries. However, we recommend tax reduction on capital goods like farm tractors because capital goods are employed in the production of other goods in the region.

We recommended that the government attracts more FDI, both total FDI and bilateral FDI from the UK as it supports the income convergence process. Moreover, we recommend the EAC member states to spend more of the share of national income on education. The allocated income can be used to train the labour force, hence widening the skill base and level of the EAC citizenry. We note that improvement of human capital supports the economic performance of a country as workers become more productive because of augumenting workes' productive skills. Also, supporting domestic investors through the provision of cheap investment loans and looking for the external market is something the government should do. For instance, the government could improve infrastructure to help reduced transaction costs and speed up the movement of goods within the EAC region so that these goods quickly reach foreign markets mainly the UK, Germany, and the US.

Besides, political stability within the region should be given higher priority. Improvement of institutional quality such as the rule of law, control of corruption and regulatory quality would ensure that the EAC region becomes politically stable. The focus on reliable institutional quality premised on the idea that the aggrieved individuals, businesspeople, and political parties can exercise their constitutional right in a fair, predictable and consistent judiciary. We believe the improvement in the institutional quality would promote political stability by guaranteeing right for political participation and individual civil liberty. The positive outcome of institutional quality has been extensively discussed by North (1990). According to North (1990), presence of sound institutional quality increases economic participation of broad range of economic actors across different sectors (i.e., primary, secondary and tertiary industries).

In the context of bilateral FDI between the UK and the EAC member countries, we also recommend that the EAC region (i.e., Uganda, Kenya, Tanzania and Rwanda) design policies to attract more

bilateral FDI from the UK. Given that FDI intensity ratio significantly reduction of income disparity between the UK and the EAC region both in Short and long-run the study the period.

Furthermore, unlike the distance between the EAC regional member countries and the UK, language similarity has significantly played a role in reducing income disparity between the EAC region and the UK. Therefore, we recommend that the government promote the teaching of quality English language (i.e. both spoken and written). The increase in language similarity eases communication and speed up technology spillover from foreign firma to local firms hence improving local firms' productivity – however, this conditioned on improved absorptive capacities of the EAC members countries. For example, improved education system and language between the UK nationals to the EAC nationals reduces communication barrier, a medium of exchange critical to technology transfer. In other words, because of ease of communication, we believe it increases interaction between the UK citizens to those of the EAC nationals hence greater transfer of technology from foreign firms to local firms.

Finally, it should also be understood that attracting more bilateral FDI from the UK to the EAC region would also speed up the income convergence (i.e., beta convergence). Moreover, we found also found language and distance to have a significant role in reducing income gap between the EAC member countries and the UK (refer to Table 4.8).

We recommend that the distance between the UK and the EAC region can be reduced through identification of faster route as well as mode of transports, such as air transport.

Chapter Five

5.1 General conclusion, research limitations and future research directions

Chapter five presents brief general conclusion. We also provided research limitations encountered during our studies. Moreover, we suggested areas of future research based on identified gaps from our analysis. We start by providing general conclusion, followed by research limitations, with future research direction coming last.

5.1.1 General conclusion

In our general conclusion, we try to bring three self-contained seemingly unrelated empirical chapters together. We did so by presenting common grounds between these three pieces of research, determinants of FDI, foreign direct investment (FDI) verses growth and bilateral FDI convergence. These three key research questions are relevant for the growth and prosperity of the East Africa Community (EAC) region.

In chapter two, we analysed determinants of FDI to the EAC region from 1970 – 2017. We wanted to know whether the region received different FDI types. We looked at three types of FDI. The resource seeking FDI, market seeking FDI, and efficiency seeking FDI. Based on our empirical results, we conclude that the EAC region only received marketing seeking FDI during the study period. Also, the region received resource seeking FDI type only in the presence of political stability. Also, we conclude that our key variables such as labour availability and natural resources availability linked to efficiency seeking and resource seeking FDI respectively had zero effect on efficiency seeking and resource seeking FDI. However, the EAC region received resource seeking FDI in the presence of political stability proxy by political right.

It is in this context; we conclude that the EAC region did not receive efficiency seeking FDI.

For the discussion on efficiency seeking FDI, refer to Table 2.4, while market seeking FDI and resource seeking FDI type refer to Table 2.6 and 2.8 respectively (in Chapter two).

Based of our empirical evidence, the EAC region should improve on market size and access to market seeking foreign investors if they are to attract significant market seeking FDI. For instance, banning importation of consumer goods particuraly from China would encourage market seeking FDI to establish manufacturing facilities to service domestic market. Also, political stability is required for the region to receive resource seeking FDI. However, for the

efficiency seeking, this can be achieved by reducing costs of production. For instance, ensuring large pool of workforce are productive. This can be achieved through training and ensuring they are in good health.

We reported in chapter three that the EAC region significantly receives FDI in the long run. Although FDI determinants is a research topic in its entirety. However, understanding key drivers of FDI to the EAC region is crucial as it provides critical investment capital. Solow's (1956) argues that increase in FDI to poor economies like those of the EAC region would raise capital-labour ratio. And that rasing labour-capital ratio would increase labour productivity per unit in developing countries/region. In this context that FDI are expected to contribute positively to the economic growth of the host economies.

However, our empirical results provide contrasting results. It shows that FDI had zero effect on the economic growth of the EAC region during the study period. We argued in the empirical section that the zero effect of FDI on economic performance of the EAC region could be due to low volume of the FDI to the region, in addition to absorptive capaticity that might exist in the region. For example, poor infrastructure such as poor road, poor communication, underdeveloped banking, weak education system and luck of energy infrastructure.

We also looked at convergence process in the EAC region as reported in Chapter 4. We found that total FDI had zero effect on income convergence process. The zero effect of total FDI to income convergence, we noted could be due low volume of FDI, and most FDI goes to primary sector (extractive sector) which is associated to low technology spillover to the local economies vis-à-vis manufacturing sector. However, in terms of bilateral FDI from the UK to the EAC region during the study period had significant effect on reducing income gap between the EAC significantly raises the income levels and reduces growth gap between the UK and the UK and the EAC member countries. The significant effect of the bilateral FDI from the UK to the EAC region could be due to well spread investment to different sectors of the economy such as service sector, particurly banking, consultancy, and telecommunication. Also, they might be investing in manufacturing sector. For instance, Bisquit factory like Britainna results to greater technology spillover foreign firms like the UK to the rest of the economy hence leading to significant economic effect to the host economies like the EAC region. Hence resulting into reduction of income gap between the UK and the EAC region during the study period.

Given the significance of the bilateral FDI to the EAC region to the EAC region, we draw our policy recommendation to encourage more bilateral FDI from the EAC region to the EAC region. Also, based on our empirical results, most of important variables in the growth chapter had zero

effect on the economic growth of the EAC region. For instance, when we investigated the role of tradeable output to non-tradeable output on economic growth of the EAC region from 1970 – 2017, we included key control variables considered to have influence on economic performance an economy. From Table 3.12, empirical results shows that human capital and labour force (unskilled labour) both had significant positive contribution the to the economic growth of the EAC region during the study period. Based of the importance of these variables, we drew our policy recommendation by suggesting the EAC region should consider training workforce to improve their productivity. Romer (1986) and Solow (1956), Arrow (1962) both noted thateducated workforce are more productive and so countries, particularly developing countries should strive to educate their citizenry to increase the absorptive capacity of the developing countries.

Our study also shows that the technology gap and trade liberaliation had singificat negative effect of the economic grwth of the EACregion during the study period. We argued that for te case of technology gap, the technology gap between developed countries and the EAC region could be reduced by educating workers in the EAC region so that they be more innovative and creative. Moreover, they would be in a better position to adopt and implement foreign technology because of technology spilloverovers from foreign firm to local firms.

In terms of trade liberalization, imposition of quats and tarrif could help limit importation of consumer goods that can be readily manufacture in the EAC region. However, importation of capital goods should be encouraged as they are use in the production of other goods.

It is imperative to note that the income convergence in this thesis is seen as an extension of the growth chapter.

In terms of our findings, we found that in long-run these EAC member countries converges due limited heterogeneity amongst them. In a nutshell, we can see a link between FDI-Growth nexus and income convergences in addition the role of FDI on economic growth and income convergence.

In other words, FDI promotes economic growth and subsequently, the economic growth in turn supports the process of income convergence. The role of FDI on convergence comes as foreign investors relocate to poorer income countries in the EAC region seeking for higher return on their investments.

5.1.2 Research limitations

As with the previous studies (Orlic et al. 2018, Kang and Jiang, 2012), our thesis isnot without limitations. Therefore, the limitations encountered in this study need to be highlighted as it provides an avenue for further future exploration. Firstly, due to the nature of empirical exercise that relies on secondary databases, the lack of data availability limits the empirical boundaries of our research. For example, our study period for the bilateral FDI from the UK and the income convergence in the EAC region ranges from 2000 to 2017, the period where the data was availability.

Besides, due to lack of data, we excluded Burundi from panel data study pertaining effect of bilateral FDI ratio from the UK to the EAC region. Furthermore, because of inadequatcy of data from 1970 – 2017, Burundi was excluded from panel data study which explores the effect of FDI on the ratio tradeable to non-tradeable output and the effect of ratio tradeable output to non-tradeable output on the economic growth of the EAC region.

For instance, we found secondary data, generally used for institutional quality do not start from 1970. These data were corruption, regulatory quality, the rule of law. Therefore, we resolve the problem by using official development aid per capita as a proxy for institutional quality. Adopting official development aid is based on the idea that aids, mostly received from western countries, are conditioned on institutions' improvement. Moreover, data for tax, a good measure for favourable host country policies towards MNCs intending to invest directly did not exist from 1970. Also, there were a lot of missing data.

Secondly, in this study, we also found the computing technology gap, FDI ratio, the ratio of tradeable output to non-tradeable-output variables to be time-consuming.

Thirdly, we also noticed that empirical literature on income convergence for the African economies was non-existent. Therefore, we resolve the problem associated with shortage of existing empirical on the African economies by considering empirical literature from other developing, emerging, and developed economies.

Fourthly, in econometrics and statistics, a structural break usually leads to huge forecasting errors and unreliability of the model due to unexpected change over time in the parameters of the regress models. The presence of structural breaks in the model comes due to successful new policy or technological change implementation (Baltagi et al., 2016). So, ignoring structural breaks might leads to inconsistency in the estimation and invalid inference. According to Baltagi et al., (2016),

just like our study, most literatures on panel data models seen in the workings of Pesaran and Yamagata (2008), Phillips and Sul (2007), Alvarez and Arellano (2003), Hahn and Kuersteiner (2002) did not consider structural breaks because of implicit assumption that the slope coefficients are constant over time.

Furthermore, in our study based on trendline analysis of key variables from 1970 to 2017 seen in Chapter 2 and 3, it might be possible that there is presence of structural breaks potentially caused by introduction of new policies (i.e., custom unions) in the EAC region. Therefore, caution is needed when interpreting our empirical results. We also note that sample sizes are imperative in economics studies. For instance, large sample size gives better understanding of the variables under investigation.

Recently, Gavilanes (2020) discussion, derived from Mason and Perreault (1991) study shows that, categorisation of sample size depends on the numbers of observations. According to Mason and Perreault (1991), a sample size of 30 observations or fewer is considered small sample sizes. However, for sample size consisting of 150 observations can be considered medium size (i.e., moderate) while samples larger than 250 or 300 are considered large.

Gavilanes (2020) posit that samples posed key challenges that relates to statistical inference. In other words,

> "……. *using a sample smaller than the ideal increases the chance of assuming as true a false premise" (Gavilanes 2020, p.22).*

Considering two types of errors in statistical hypothesis testing (the type I and II errors). Where type 1 error refers to the null hypothesis (relative to a specific proposition) is true but are rejected. For type 11 errors null hypothesis is false but we do not reject it.

Gavilanes (2020) argument based on Colquhoun (2014) study indicates that, a small sample size and incorrect inferences in the parameters' significance tests suggest that a p-value lesser than 5% might not be statistically significant because the results are derived from the underpowered statistical inferences. Therefore, in context of our study (Chapter 4) using a small size could be that it is possible to witness type I error in our regression models.

Gavilanes (2020, p. 23) summarised analysis of potential danger in using small size as follows,

> "*Researchers should note that the overwhelming case is that reduction in sample size is far more likely to reduce the likelihood of finding any significant relationships than to increase it. This is due to the way that sample size affects test power. The researcher sets the level of type I error (the probability of accepting a hypothesis when false in reality) in any test, normally at 0-05, and critical values calculated for the given size of sample. Small sample sizes are no more likely to result in wrongfully claiming a relationship exists than is the case for larger samples".*

Conversely, we found interesting report by Lin et al., (2013) which indicates that, as the sample size increases, the p-value starts to decrease tremendously to zero (0), and that this could lead to statistically significant results which are not sensitive over the regression analysis.

Gavilanes (2020) further suggests that empirical results based on Jackknife approach is more suitable for lower sample sizes. On the hand, Bootstrap approach is reported to be sensitive for the lower sample sizes and therefore might not be suitable for establishing statistically significant relationships in the regressions. According to Gavilanes (2020), the Monte Carlo simulations also shows that when a significant relationship is found in small samples, this relationship will also tend to remain significant when the sample size is increased. Overall, we note that both the size and quality of data are equally important in economics study. None the less, due to data limitations in this study seen in Chapter 4, caution is required when interpreting our results as the empirical results might be affected by type 1 errors as discussed by Gavilanes (2020).

5.1.3 Future research directions

We suggest five future areas of research to be considered by potential scholars, as seen below. This based on gap identified from this study, and existing empirical literature to African economies.

- We recommend that the future study should explore the exietnec of FDI and growth nexus in the EAC region by accounting for structural breaks in our data, as this would improve the performance of the estimates.
- Based on data availability, we suggest future research to investigate the contribution of bilateral FDI from the UK to Burundi's economy. In other words, whether FDI from the UK supports the economic performance of Burundi also, whether such FDI results in Beta (β) convergence and Sigma (σ) convergence between the UK and Burundi.
- Also, a future study could explore the effect of FDI on the ratio tradeable output to non-tradeable output, besides, to extending the study to understanding the contribution of the ratio tradeable output to non-tradeable output on the economic growth of Burundi.
- Other potential areas for future studies could be to investigate the effect of FDI on the economic performance of the economic Corporation for central African States (ECCAS). The economic community comprising of eleven countries. We believe that using an extended study period would provide rich information because of extended study periods (i.e., 1970 to recently available data). The result might further shade more light on our empirical results as they are both small open economies with a roughly similar level of income.
- Finally, we also recommend the future researcher to adopt panel unit root test with structural breaks. Ling et al. (2013) and Heil and Selden (1999) found that accounting for structural break increases the chance of researchers rejecting the presence of unit root in panel datasets. Moreover, Perron (1989) also noted that by not including a structural break in 1973, it could incorrectly result in one not to reject the unit root hypothesis. We also argue that the selection of the technique to test for panel unit root is equally imperative. For instance, using IPS does not account for structural breaks so, one needs to split the dataset, while newly proposed bootstrap Fisher test technique by Maddala and Wu (1996) allow a researcher to include structural breaks without having to split the samples. Therefore, the researcher using secondary panel dataset for developing countries should account for the effect of given global economic events. These global economic events might include among others the first and second oil shocks of the 1973 – 1995 and 1979 –

1980 respectively, commodity crisis of the 1985 –1986, the Asian financial crisis of the year 1997 – 1986, and finally the recent financial crisis of 2008

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APPENDICES

Appendix 1: Definition of secondary variables sourced from World Bank database

	Indicator Name	Definition
Telephone line	Fixed telephone subscriptions (per 100 people)	Fixed telephone subscriptions refers to the sum of active number of analogue fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones.
FDIA	Foreign direct investment, net inflows (% of GDP)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.
GDP	GDP (current US$)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.
GDPPC	GDP per capita (current US$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets

		or for depletion and degradation of natural resources. Data are in current U.S. dollars.
Fiscal policy (Government expenditure)	General government final consumption expenditure (% of GDP)	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.
GFCF	Gross fixed capital formation (% of GDP)	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.
Money supply	Broad money (% of GDP)	Broad money (IFS line 35L..ZK) is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper.
Resources	Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.
Trade	Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.
Inflation	Inflation,	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the

	consumer prices (annual %)	average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.
HC	School enrollment, primary (% gross)	Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Primary education provides children with basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music.
POPB	Population ages 15-64 (% of total population)	Total population between the ages 15 to 64 as a percentage of the total population. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.
POPA	Population ages 15-64, total	Total population between the ages 15 to 64. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.
Agricultural output	Agriculture, value added (% of GDP)	Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator.
Manufacturing output	Manufacturing, value added (% of GDP)	Manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator.

Service output	Services, etc., value added (% of GDP)	Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The industrial origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator.
	Net ODA received per capita (current US$)	Net official development assistance per capita is disbursement flows (net of repayment of principal) that meet the DAC definition of ODA and are made to countries and territories on the DAC list of aid recipients; and is calculated by dividing net ODA received by the midyear population estimate.

Appendix 2: Definition of secondary variables sourced from UNCTAD database

	Indicator Name	Definition
Bilateral FDI flows and stock	Bilateral FDI Flows and stock Annual FDI stock US $ in current price in millions	FDI flows are transactions recorded during the reference period (typically year or quarter). FDI stocks are the accumulated value held at the end of the reference period (typically year or quarter). FDI flows comprise mainly three components: acquisition or disposal of equity capital. FDI includes the initial equity transaction that meets the 10% threshold and all subsequent financial transactions and positions between the direct investor and the direct investment enterprise; reinvestment of earnings which are not distributed as dividends; inter-company debt.
GDP_PCGROWTH	Annual GDP per capita growth rate	Gross domestic product: Total and per capita, growth rates, annual measured as Item: Annual average growth rate per capita Growth rates are based on GDP at constant 2015 US dollars.
GDP per capita	GDP US Dollars at current prices per capita	Gross domestic product: Total and per capita, current and constant (2015) prices, annual Item: US dollars at current prices per capita

Appendix 3: Definition of secondary variables sourced from Freedom house database.

PR	Political right	*Political Rights Ratings – A country or territory is assigned political rights rating—based on its total scores for the political rights questions. Each rating of 1 to 7, with 1 representing the greatest degree of freedom and 7 the smallest degree of freedom, corresponds to a specific range of total scores (see tables 1 and 2).
CL	Civil liberty	**Civil Liberties Ratings – A country or territory is assigned civil liberties rating—based on its total scores for civil liberties questions. Each rating of 1 to 7, with 1 representing the greatest degree of freedom and 7 the smallest degree of freedom, corresponds to a specific range of total scores (see tables 1 and 2).

Note: For more detail on the rating and status characteristics of political right and civil liberty are provided below.

***Political right**

1 – Countries and territories with a rating of 1 enjoy a wide range of political rights, including free and fair elections. Candidates who are elected actually rule, political parties are competitive, the opposition plays an important role and enjoys real power, and the interests of minority groups are well represented in politics and government. 2 – Countries and territories with a rating of 2 have slightly weaker political rights than those with a rating of 1 because of such factors as political corruption, limits on the functioning of political parties and opposition groups, and flawed electoral processes. 3, 4, 5 – Countries and territories with a rating of 3, 4, or 5 either moderately protect almost all political rights or strongly protect some political rights while neglecting others. The same factors that undermine freedom in countries with a rating of 2 may also weaken political rights in those with a rating of 3, 4, or 5, but to a greater extent at each successive rating. 6 – Countries and territories with a rating of 6 have very restricted political rights. They are ruled by authoritarian regimes, often with leaders or parties that originally took power by force and have been in office for decades. They may hold tightly controlled elections and grant a few political rights, such as some representation or autonomy for minority groups. Page 5 of 18 7 – Countries and territories with a rating of 7 have few or no political rights because of severe government oppression, sometimes in combination with civil war. While some are draconian police states, others may lack an authoritative and functioning central government and suffer from extreme violence or rule by regional warlords.

****Civil liberties**

1 – Countries and territories with a rating of 1 enjoy a wide range of civil liberties, including freedoms of expression, assembly, association, education, and religion. They have an established and generally fair legal system that ensures the rule of law (including an independent judiciary), allow free economic activity, and tend to strive for equality of opportunity for everyone, including women and minority groups. 2 – Countries and territories with a rating of 2 have slightly weaker civil liberties than those with a rating of 1 because of such factors as limits on media independence, restrictions on trade union activities, and discrimination against minority groups and women. 3, 4, 5 – Countries and territories with a rating of 3, 4, or 5 either moderately protect almost all civil liberties or strongly protect some civil liberties while neglecting others. The same factors that undermine freedom in countries with a rating of 2 may also weaken civil liberties in those with a rating of 3, 4, or 5, but to a greater extent at each successive rating. 6 – Countries and territories with a rating of 6 have very restricted civil liberties. They strongly limit the rights of expression and association and frequently hold political prisoners. They may allow a few civil liberties, such as some religious and social freedoms, some highly restricted private business activity, and some open and free private discussion. 7 – Countries and territories with a rating of 7 have few or no civil liberties. Their governments or powerful nonstate actors allow virtually no freedom of expression or association, do not protect the rights of detainees and prisoners, and often control most economic activity. The gap between a country or territory's political rights and civil liberties ratings is rarely more than two points. Politically oppressive states typically do not allow a well-developed civil society, for example, and it is difficult, if not impossible, to maintain political freedoms in the absence of civil liberties like press freedom and the rule of law